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From The Editor In Chief

The AGE Secretariat prepared a declaration with input from the Executive Committee, Council, AGE members and experts and they encouraged our society to circulate it at national level.

The declaration consists of a main corpus presenting three key demands and outlining AGE concerns about the current political and socio-economic context. It also recalls AGE's common vision of a society based on solidarity among generations and a number of responsibilities and duties older people hold themselves.

The summary of this declaration is below.

Toward a better recognition of and respect for older people's rights in the EU

Members of AGE Platform Europe met at the 2015 General Assembly to call on European Institutions, EU Member States, local and regional authorities to mobilise their respective capacities in order to promote and secure the rights of all older women and men residing on their territory. AGE recommendations for policy alternatives speak out against the practices that facilitate rights violations against older people and call for rights-based reforms at local, national and EU levels.

While recognising the importance of the cooperation with EU and national policy makers so far, AGE members urge them to support further open and transparent mechanisms for the engagement of civil society in policy making, in order to address the complex realities faced by older people at grass roots level, and to:

I. Apply the existing legal framework and monitor its impact on the rights of older people;

II. Strengthen the legal framework to better protect the rights of older people and eliminate age discrimination; and

III. Acknowledge older people's rights and ensure they underpin the silver economy to guarantee that its innovation potential is used to meet the specific needs of Europe's ageing populations.

Prof. Yesim GOKCE KUTSAL

Editor in Chief

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RESEARCH

MORTALITY AFTER TRAFFIC ACCIDENTS OF ELDERLY AGE GROUPS DEFINED BY WORLD HEALTH ORGANIZATION CATEGORIZATION

ABSTRACT

Introduction: Elderly patients have increased mortality compared with younger patients after experiencing trauma.Although different categories of geriatric age groups exist in medical literature, the World Health Organization categorizes geriatric people as older (from 65 to 79 years old) and oldest-old (≥80 years old). The aim of this study was to compare injury severity, mortality with hospitalization, intensive care unit, andsurgery rates with hospitalization time of younger patients with those of elderly people and within 2 geriatric age groups admitted to the emergency department after traffic accidents.

Materials and Method: Patients admitted to a teaching hospital emergency department after traffic accidents between January 1, 2012 and December 31, 2013 were enrolled in this retrospective study. Age groups were defined as young, older and oldest-old. Injury severity was assessed with the Abbreviated Injury Scale (AIS) for 6 body regions and the Injury Severity Score (ISS). p<0.05 was considered statistically significant.

Results: In total2687 patients were included in the study;196 (6.7%) patients were classified as older and 59 (2.0%) patients were classified as oldest-old. Mortality (6.3% vs. 0.7%, p<0.001) with hospitalization (23.1 vs. 12.3%%, p<0.001), ICU admission (7.1% vs. 2.3%%, p<0.001), and surgery rates (11.8% vs. 6.0%%, p<0.001) with hospitalization time (1.1 vs. 2.8 days) were higher in elderly patients than in young patients but were similar between the 2 geriatric age groups.

Conclusion: Elderly patients experience more severe trauma after traffic accidents young patients; however, no difference was observed between the 2 geriatric age groups defined by World Health Organization.

Key Words: Trauma, Geriatrics; Injury.

ARAŞTIRMA

DÜNYA SAĞLIK ÖRGÜTÜ SINIFLANDIRILMASINA GÖRE TANIMLANAN YAŞLI YAŞ GRUPLARININ TRAFİK KAZALARI SONRASI MORTALİTENİN DEĞERLENDİRİLMESİ

ÖZ

Giriş: Travma, geriatrik yaş gruplarında en sık ölüm nedeni olmasa da, genç hastalarla karşılaştırıldığında geriatrik hastalarda mortalite daha fazladır. Tıbbi literatürde farklı geriatrik yaş sınıflamaları olup Dünya Sağlık Örgütü (DSÖ), yaşlı hastaları genç-yaşlı (65-79 yaş) ve yaşlı-yaşlı (80 yaş ve üzeri) olarak gruplandırmaktadır. Bu çalışmanın amacı acil servise trafik kazası sonrası gelen genç ve yaşlı hastalar ile her iki geriatrik yaş grubu arasında yaralanma şiddeti, mortalite ile hastaneye yatış, yoğun bakım yatış ve operasyon oranlarını karşılaştırmaktır.

Gereç ve Yöntem: Bu retrospektif çalışmaya acil tıp kliniğine 1 Ocak 2012 ile 31 Aralık 2013 tarihleri arasında trafik kazası ile başvuran hastalar alındı. Yaş grupları genç, genç-yaşlı ve yaşlı-yaşlı olarak tanımlandı. Yaralanma şiddeti 6 vücut bölgesinde hesaplanan Abbreviated Injury Scale (AIS) ve Injury Severity Score (ISS) ile değerlendirildi. p<0.05 değeri istatistiksel olarak anlamlı kabul edildi.

Bulgular: Çalışmaya 2687 hasta alındı ve 196 (6.7%) hasta genç-yaşlı ve 59 (2.0%) hasta yaşlı-yaşlı olarak sınıflandırıldı. Genç hastalarla karşılaştırıldığında geriatrik hastalarda mortalite (6.3% vs 0.7%, p<0.001), hastane yatış (23.1 vs 12.3%%, p<0.001), yoğun bakım yatış (7.1% vs 2.3%%, p<0.001) ve operasyon oranı (11.8% vs 6.0%%, p<0.001) daha fazla olmasına rağmen rağmen her iki geriatrik yaş grupları arasında bir fark saptanmadı.

Sonuç: Genç hastalarla karşılaştırıldığında geriatrik hastalarda trafik kazası sonrası daha ciddi travma geçirmesine rağmen Dünya Sağlık Örgütü tarafından tanımlanan 2 geriatrik yaş grubunda bir fark saptanmamıştır.

Anahtar Sözcükler: Travma; Geriatri; Yaralanma.

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Introduction

Trauma in the elderly is a growing problem of health systems due to an increased life-span. Similar to a general trend in the world, Turkey has an increasing elderly population; although the geriatric population currently accounts for 7.7% of the total population, the number is expected to rise to 10.7% in 2023 (1). Advancements in treating chronic conditions have not only led to increased mobility of elderly people, but also lead to a predisposition to injuries. Although a more common cause of trauma in young patients, traffic accidents remain a significant cause of trauma-related injuries in elderly people (2-5).

Elderly patients suffer a higher morbidity and mortality after trauma than younger patients because of age, preexisting medical conditions, mechanisms of injury, and increased rate of complications (6, 7). As young age is generally described as younger than 65 years, several age groupings exist in public health and trauma-related medical literature for defining older patients. One categorization is based on sub-grouping patients as young-old (65-74 years old), middle-old (75-84 years old), and oldest-old (≥85 years old). Several studies conducted in the past in other areas of medical literature used this grouping, although a standard does not exist (8). The World Health Organization (WHO) categorizes older people as those aged 65 to 79 years and oldest-old as aged 80 years and older when describing geriatric age groups (9). Although geriatric trauma patients older than 75 years of age have increased mortality, a relationship between trauma severity and geriatric age groups has not been studied in the medical literature.

The aim of this study was to compare the severity of trauma after traffic accidents of young and older patients within 2 geriatric sub-groups in terms of anatomic trauma scores and mortality as well as hospitalization, intensive care unit (ICU) admission and surgery rates.

We hypothesize that although young people have better outcomes after trauma, elderly patient sub-groups (older people vs. oldest-old) have similar outcomes after traffic accidents because of different physiological responses to trauma. An explanation of this result may be a result of the heterogeneity of medical conditions, the impact of trauma on the patient and varied responses to traumatic injuries.

Materials and Methods

Patients admitted to Izmir Training and Research Hospital Emergency Medicine Clinic following traffic accidents between January 1, 2012 and December 31, 2013 were enrolled in this retrospective cross-sectional study. Patients' clinical, laboratory, and radiology reports with forensic reports were obtained from patient charts and hospital electronic records system. Patients with insufficient data, patients aged ≤18 years, patients who discharged themselves, and patients who were transferred to our hospital after stabilization or transferred to another hospital after stabilization due to unavailable beds were excluded in the study. Traumatic cardiac arrests on arrival without further diagnostic study or autopsy were also excluded. Any patient with a score of 0 was also excluded. Demographic characteristics included accident types (motor vehicle, motorcycle, or pedestrian accident), gender, and age.

Trauma severity is assessed by the generally approved Abbreviated Injury Scale (AIS), which divides the body into 6 regions (head–neck, face, thorax, abdomen–pelvic organs, extremities–pelvis, and external), and severity of injury is graded from 0 to 6 (none to maximal (untreatable, results in death)). Scores of 3 or more are considered serious injury. The Injury Severity Score (ISS), derived from AIS, is calculated by the sum of squares of the three most severely injured body regions and ranges from 1 to 75. Major trauma is defined as an ISS score of 15 or more.The primary outcome is the mortality (during ED or ward/ICU) stay, and the secondary outcome is hospitalization and ICU admission rate and surgery need with hospitalization time.

Patients aged 18–64 years were considered young, while patients aged 65 years and older were considered elder. Although a scientific consensus of sub-grouping elderly patients does not presently exist, we chose the WHO categorization of geriatric populations into 2groups, patients aged 65 to 79 years as older and patients aged 80 years and older as oldest-old. We performed statistical analysis of trauma severity between young and elderly patients and within the 2 sub-groups of geriatric patients (older vs. oldest-old) using AIS scores for 6 regions of the body and ISS as well as hospitalization, surgery and ICU stay rate, hospitalization time and mortality.

This study was approved by the institutional ethics committee, which in turn is approved by the Ministry of Health of the Turkish Republic. Statistical analysis was performed using SPSS 20.0 for Windows (SPSS, Chicago, IL, USA). Normality of distribution was assessed with Kolmogorov–Smirnov testand Q–Q plots. For comparison of groups, the Kruskal–Wallis test was used for analysis of non-parametric continuous variables and Chi-square test for categorical values. Comparisons of categorical values were assessed with Chi-square test or Fisher's exact test when variable count was <5. $p<0.05$ was considered statistically significant.

Results

During the study period, 4093 traffic accident victims were admitted to the emergency department, and after exc-



Table 1— Demographic Characteristics of the Patients

Characteristics	Data (n=2942)
Age (years)	
Mean, years	37.9 (18–90); sd=16.3
Young (18–64 years)	2687 (91.3%)
Older (65–74 years)	196 (6.7%)
Oldest-old (85 and more)	59 (2.0%)
Gender	
Male/Female	2129 (72.4%) / 813 (27.6%)
Traffic accident type	
Motor vehicle passenger	1280 (43.5%)
Pedestrian struck	1212 (41.2%)
Motorcycle/bicycle	450 (15.3%)
ISS	
Minor (1–15)	2858 (97.1%)
Major (≥16)	84 (2.9%)

lusion criteria were applied, 2942 patients were included in the study. In total, 2129 (72.4%) of patients were male and the mean age was 37.9 (SD 16.3). In total, 2687 (91.3%) of patients were classified as young, 196 (6.7%) were classified as older and 59 (2.0%) were classified as oldest-old. The most common form of accident was motor vehicle passenger, followed by pedestrian struck and motorcycle/bicycle accident. After calculating ISS scores, 84 (2.9%) patients were found to have major trauma (Table 1).

When trauma severity was assessed by AIS for each of the 6 body regions using the Mann–WhitneyU test, trauma severity of face, abdomen, and external injuries was similar between young and elder people (≥65 years old) (p=0.12, 0.93 and 0.88, respectively) (Table 2). However, elderly people had more severe traumatic injuries of head-neck, thorax, and pelvis–extremities injuries and had higher ISS scores than young patients (p=0.03, <0.001, 0.02, and <0.001, respectively). When we analyzed trauma severity between the 2 geriatric sub-groups (older vs.oldest-old), oldest-old people had higher AIS scores for the abdomen region, whereas AIS scores for the remaining 5 regions and ISS scores were similar (p=0.47 for head–neck, p=0.39 for face, p=0.24 for thorax, p=0.04 for abdomen, p=0.75 for pelvis–extremities, p=0.58 for external, and p=0.53 for AIS).

A Mann–Whitney-U test indicated that hospitalization times of elderly patients were longer than those of young patients (Mdn=1632.2 vs.1456.3, U=301625.5, p<0.001). When another analysis was performed for geriatric age groups, the test did not show a significant difference between the 2 groups (Mdn=125.7 vs. 131.2, U=7614.0, p=0.43).

The primary outcome was assessed by Chi-square test, and results showed that mortality was significantly higher in elderly patients than in young patients (6.3% vs. 0.7%, p<0.001) (Table 3). Older patients were 8.93 (95%CI, 4.57–17.46) times more likely to die following a traffic acci-

Table 2— Comparison of Trauma Severity in terms of AIS and ISS Between Young and Elder Patients and within Two Geriatric Sub-groups.

Trauma Regions and severity	Young vs. elder (n=2942)	Older vs. oldest-old (n=255)
Head–neck AIS	1463.5 vs. 1555.8, U=364.1, p=0.03	126.5 vs. 132.9, U=6073, p=0.47
Face AIS	1466.6 vs. 1523.3, U=355.8, p=0.12	129.5 vs. 122.9, U= 5480.0, p=0.39
Thorax AIS	1457.6 vs. 1617.5, U=379.8, p=<0.001	130.2 vs. 120.8,U= 5357.5, p=0.24
Abdomen–pelvic organs AIS	1471.7 vs. 1469.5, U=342.1, p=0.93	125.9 vs. 135.1, U= 6202.0, p=0.04
Pelvis–extremities AIS	1461.2 vs. 1579.8, U=370.2, p=0.02	125.0 vs. 138.1, U= 6377.0, p=0.75
External AIS	1471.4 vs. 1472.3, U=342.8, p=0.88	128.2 vs. 127.5, U= 5752.5, p=0.58
ISS	1440.5 vs. 1798.5, U=426.0, p=<0.001	126.5 vs. 133.0, U= 6079.0, p=0.53

Note: First values are medians, with respective U and p values.

Table 3— Comparison of Hospitalization, ICU Admission and Surgery Rate, Hospitalization Time and Mortality Between Young and Elder Patients and within Two Geriatric Sub-groups.

	Young vs. Elder (n=2942)	Older vs. Oldest-old (n=255)
Mortality	20 (0.7%) vs. 16 (6.3%), χ^2=58.93, p<0.001	12 (6.1%) vs. 4 (6.8%), χ^2=3.29, p=0.77
Hospitalization rate	331 (12.3%) vs. 59 (23.1%), χ^2=23.71, p<0.001	40 (20.4%) vs. 19 (32.2%), χ^2=3.55, p=0.06
ICU admission	61 (2.3%) vs. 18 (7.1%), χ^2=20.44, p<0.001	11 (5.6%) vs.7 (11.9%), χ^2=2.70, p=0.10
Surgery	160 (6.0%) vs. 30 (11.8%) χ^2=13.01, p<0.001	20 (10.2%) vs. 10 (16.9%), χ^2=1.99, p=0.16

Note: First values are number of patients with percentage in brackets, with respective Chi-square and p values.

dent than young patients. Assessment of the mortality rate between the 2 geriatric sub-groups using Fisher's exact test revealed no statistical difference between the two groups (6.1% vs. 6.8%, p=0.77).

Secondary outcome, hospitalization, ICU admission, and surgery rates were also assessed by Chi-square test, showing that elderly patients had higher hospitalization (23.1 vs. 12.3%), ICU admission (7.1% vs. 2.3%), and surgery rates (11.8% vs. 6.0%) than young patients (p<0.001 for all tests). Older patients were 2.14 (95%CI, 1.57–2.93) times more likely to be hospitalized, 3.27 (95%CI, 1.90–5.62) times more likely to be admitted to the ICU and 2.10 (95% CI, 1.39–3.18) times more likely to undergo surgery than young patients. Comparison of secondary outcomes within the two sub-groups of elderly patients indicated no statistical difference between the three (p=0.06, 0.10, and 0.16, respectively).

Discussion

This retrospective study demonstrated that although elderly patients have higher mortality with admission to hospital, ICU and surgery rates than young patients, the subgroups of the geriatric population (older patients aged 65–79 years and oldest-old patients aged 80 years and older) affected by trauma have similar mortality and prognosis after traffic accidents. These results are in contrast with previous studies conducted both in late 90s and 2000s (6,7,10,12).

A possible explanation of findings in previous studies can result from the selection criteria of study populations. Database studies use patients admitted to hospital following trauma and fail to include young and elderly patients discharged from ED after treatment or transferred to intermediate care who are not included in analysis (12). Also registries such as National Trauma Data Bank or statewide trauma registries don't include the mortality after hospital discharge but evidence has shown elderly trauma victims experience mortality after hospital discharge (13).

Grouping elder people in age categories is a challenging task, both epidemiologically and clinically. WHO addressed that age is a major factor for categorization but contributing medical, socio-economic, cultural, and country-specific characteristics also influence categorization. Old age accompanied by poverty and chronic debilitating medical conditions with limited or no access to medical health care challenges the chronological definition of old age when patients in their mid-50s, with limited or no healthcare, have an abnormal response to trauma compared with patients with more chronic health conditions, who have access to proper medical care.

Mechanisms of trauma are different in elderly patients compared to younger patients, where falls account for three-quarters of all traumas followed by motor vehicle collisions (6). Also incidence of penetrating trauma is higher in younger patients. Pre-existing medical conditions, higher mortality after serious trauma (defined as ISS>15) lead to more complicated outcome following trauma in the elderly group. One study found that 73% of elderly patients with traumatic brain injury have pre-existing medical conditions compared to %28 of non-elderly patients (11). Pre-existing medical conditions, including liver and chronic renal insufficiency, chronic obstructive pulmonary disease and steroid use were found to increase the risk of mortality and morbidity in the geriatric population (14). Also using of medications, such as ß-blockers or calcium channel blockers, may mask abnormal physiological signs of shock and can be misleading in the management of trauma patients (14,16).

Insufficiency of bony structures to protect external trauma to the central nervous system and thoracic organs as well as fragile pelvic and extremity bones contribute to higher regional and overall injury severity for the head, thoracic, and pelvic–extremity regions of elderly trauma victims, but a difference did not exist between geriatric age classifications as defined by the WHO (6, 9). In addition, an increased vulnerability of brain vessels and concomitant use of anti-aggregants with anti-coagulants use lead to higher risk of severe traumatic brain injury, which is a major contributor to trauma (6). Failure of protection of the thoracic cage by the ribs because of decreased bone intensity and muscle wasting increased with ageincreases the vulnerability of thoracic organs to trauma. A similar finding was found in another study, in which head–neck and extremity traumas were significantly higher in elderly patients (6,15).

Advanced age is a well-known contributor to mortality and injury severity of trauma patients. Several studies have divided elderly patients into different age groups and have found mixed results. An older study of Kuhne et al. found trauma victims older than 65 years had higher mortality rates, and patients older than 55 years had higher rates of complications independent of trauma severity (16). A recent study based on a database of trauma victims concluded patients older than 70 to 74 years old had greater mortality compared to younger patients (12). Current recommendation of American College of Surgeons for transferring of trauma victims older than 55 years old to trauma center is derived from the Finelli's study using Major Trauma Outcome Study in 1989 (17). This age-related risk was thought to be influenced by the increased prevalence of co-morbid medical conditions after the



age of 55 (6,7). On the other hand, Eastern Association for the Surgery of Trauma fails to give an age based threshold for triage of elderly patients for triage to trauma center and state that age is a continuous value and categorizing age groups as dichotomous value is not reliable due to insufficient data in previous studies (18).

A recent meta-analysis sought to determine the exact age at which mortality increases but was unsuccessful because of the heterogeneity of medical conditions and insufficient evidence (10). The authors concluded that patients older than 75 years who experienced trauma had higher mortality rates than patients younger than 75 years,but they were unable to identify a difference between age groups of 75 to 84 years and older than 85 years.

This study demonstrated that after traffic accidents, injury severity and mortality of geriatric age groups, as defined by WHO, are not statistically different from one another, but susceptibility to trauma of elderly people is clearly increased compared with that in young people. Physicians must recognize that elderly trauma patients are more likely to have more severe injuries, mortality, surgery, hospitalization, and ICU admission rateswith hospitalization time than young patients despite their presence in any geriatric age range, and more effort is essential to successfully diagnose concomitant injuries and treat these patients effectively.

Conflict of Interest

Authors declare that there are no conflicts of interest.

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RESEARCH

EVALUATION OF THE FINAL DIAGNOSIS OF ELDERLY PATIENTS ADMITTED TO THE EMERGENCY DEPARTMENT WITH A COMPLAINT OF VERTIGO

ABSTRACT

Introduction: We aimed to evaluate the approach and final diagnosis of elderly patients admitted to the emergency department with a complaint of vertigo.

Materials and Method: The data extracted from the hospital database were analyzed for 5,473 patients, aged over 60 years, who presented at the emergency department between January 2012 and March 2014, with complaints of dizziness-vertigo. Of these, 2,963 (54%) were females and 2,510 (46%) were males, with a mean age of 71.4 years (range, 60–96 years). We evaluated the additional diagnoses, radiological examinations and treatments received by hospitalized patients.

Results: We identified three major findings. Majority of the patients with vertigo were discharged for outpatient treatment. Life–threatening central pathologies were detected in 4.1% of patients with vertigo and although majority of the emergency room visits for vertigo in the elderly population were caused by peripheral vestibular disorders, hypertension and cerebrovascular events were equally prevalent.

Conclusion: Among the elderly population, assessing all cases of acute vertigo as presentations of peripheral vestibular deficiency can lead to missed diagnosis, including dehydration and hypotension, which are readily treated as well as serious central pathologies that require further investigation.

Key Words: Emergency Department; Vertigo; Etiology; Patient Management; Geriatrics.

Abbreviations: ACS, Acute coronary syndrome; BPPV, Benign positional paroxysmal vertigo; CT, Computed tomography; CVE, Cerebrovascular event; MI, Myocardial infarction; MRI, Magnetic resonance imaging

ARAŞTIRMA

BAŞ DÖNMESİ ŞİKAYETİ İLE ACİL SERVİSE BAŞVURAN YAŞLI HASTALARIN SON TANILARININ DEĞERLENDİRİLMESİ

ÖZ

Giriş: Baş dönmesi şikayeti ile acil servise başvuran yaşlı hastalara yaklaşımı ve son tanılarının değerlendirilmesini amaçladık.

Gereç ve Yöntem: Elektronik kayıt sistemi kullanarak, acil servise Ocak 2012 ile Mart 2014 tarihleri arasında baş dönmesi şikayeti ile başvuran 60 yaş üzeri 5473 hastanın kayıtları tarandı ve değerlendirildi. Bu hastaların 2963'ü (%54) kadın ve 2510'u (%46) erkek idi ve hastaların ortalama yaşı 71.4 olarak saptandı (60-96 yaşları arasında). Hastaneye yatırılan hastaların ek tanıları, radyolojik muayene ve aldıkları tedavilerini değerlendirdik.

Bulgular: Üç önemli bulgu tespit edilmiştir. Baş dönmesi hastaların çoğu ayaktan tedavi ile taburcu edilmiştir. Yaşamı tehdit eden merkezi sinir sistemi ile ilgili patolojiler hastaların 4.1%'sinde saptanmıştır. Yaşlı populasyonda acil servise baş dönmesi nedeniyle yapılan başvuruların çoğunluğu periferik vestibüler bozukluklara bağlı olsa da, hipertansiyon ve serebro vasküler hastalıklarda eşit yaygınlıkta saptanmaktadır.

Sonuç: Yaşlı populasyonda akut baş dönmesi ile başvuran hastaları hepsini periferik vestibüler bozukluk olarak değerlendirmek dehidratasyon ve hipotansiyon gibi çok kolay tedavi edilebilecek hastalıklara ve daha ileri incelenmeyi gerektiren santral sinir sistemi hastalıklarına yanlış tanı koymaya neden olabilir.

Anahtar Sözcükler: Acil Servis; Vertigo; Etyoloji; Hasta Değerlendirilmesi; Geriatri.

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Introduction

Vertigo is common, representing 0.5–10% of all presentations to the emergency department and costing the USA approximately 1.6 million dollars (1). The majority of patients with vertigo can be treated after a short hospitalization period; however, severe diseases such as cerebrovascular events (CVEs) or myocardial infarction (MI) can be missed (2-4).

Vertigo is a motional illusion due to acute tonic neural activity imbalance of the vestibular system, which causes the individual to experience an internal whirling motion or a sensation of their surrounding environment turning (5). Although, vertigo is one the most common reason for emergency presentation, its evaluation, particularly with regard to the potential differential diagnosis, can be difficult.

The aims of this study was to (1) evaluate the management approach and final diagnosis of elderly patients admitted to the emergency department with vertigo, (2) to determine the etiological factors associated with presentation in the elderly, (3) to determine the treatment and examination preferences and (4) to emphasize the importance of the differential diagnosis by demonstrating that certain severe diseases could also present with vertigo.

Materials and Method

Emergency presentations to the Emergency Medicine Clinics of Ankara Numune Training and Research Hospital and Amasya S.S. Training and Research Hospital were screened using the hospitals' information and management system. The data extracted from the hospital database were analyzed for 5,473 patients, aged over 60 years, who presented at the emergency department between January 2012 and March 2014, with complaints of dizziness-vertigo. Approval was obtained from Ankara Numune Training and Research Hospital institutional review board to undertake this study.

Patients diagnosed with vertigo were evaluated in different groups, as follows: treated and discharged patients; hospitalized patients; and patients who underwent radiological examinations. We also screened patients diagnosed with vertigo, and CVE, arrhythmia, MI, or infection. The rate of patients with central vertigo was determined by evaluating the radiological findings and hospital records. Other systemic or severe pathologies that can present as vertigo were evaluated from the patient files.

Results

In total, 406,475 patients over 18 years of age presented to our Emergency Medicine Clinic between January 2012 and March 2014. Of these, 5,473 patients (1.35%) over 60 years of age were included in the study; 2,963 (54%) were female and 2,510 (46%) were male, with a mean age of 71.4 years (range, 60–96 years). We identified 5,186 (94.8%) who were discharged for outpatient treatment and 287 patients (5.2%) who were hospitalized. Otorhinolaryngology and neurology departments were the common destination for admission (Table 1).

Table 1— Distribution of Patients Hospitalized with Vertigo by Departments.

Department	Number of Patients	Relative Proportions
Neurology	144	50.1%
Otolaryngology	88	30.7%
Internal Medicine	33	11.5%
Neurosurgery	13	4.5%
Cardiology	7	2.4%
Infectious Diseases	2	0.7%
Total	287	100%

We identified 1,650 patients (30%) who had a separate diagnosis in addition to vertigo, when we disregarded their hospitalization status (Table 2). However, CVEs (n=219) and hypertension (n=226) were the most common diagnoses after benign positional paroxysmal vertigo (BPPV).

In total, 971 patients (17.8%) were seen in otorhinolaryngology clinics. Peripheral vestibular pathologies were determined in 932 patients, of which 88 had been hospitalized to otorhinolaryngology departments. A further 663 patients (12.2%) were evaluated in neurology clinics, of which 144 had been hospitalized to neurology departments.

The records showed that of 1,056 (19.3%) patients underwent central nervous system imaging with either magnetic resonance imaging (MRI) or computed tomography (CT) (Table 3). Of these, a CT scan only was performed in 739 patients, an MRI scan only was performed in 5, and both MRI and CT scans were performed in 112. Central nervous system radiological revealed acute pathologies in 151 of the 1,056 patients scanned.

An additional infectious disease was diagnosed in 54 patients (0.98%) with vertigo. It was noticed that the most common specific infectious disease diagnosed was a urinary tract infection (n=19; Table 2).

Discussion

Vertigo is among the most common presentations to the emergency department (6). In various studies, the rate of

Table 2— The Distribution of Patients With Diagnoses Additional to Vertigo.

Diagnosis	Number of Patients with Additional Diagnosis	Percentage of all Patients with Vertigo
Benign positional paroxysmal vertigo	447	8.1
Headache	145	2.6
Vestibular neuronitis	124	2.2
Cerebrovascular event	219	4.0
Hypertension	226	4.1
Fluid-electrolyte imbalance	93	1.6
Hypotension	96	1.5
Hypoglycemia	69	1.2
Meniere's disease	61	1.1
Hyperglycemia	81	1.4
Anemia	36	0.65
Urinary tract infection	19	0.34
Arrhythmia	17	0.31
Intracranial mass	6	0.1
Myocardial infarction	11	0.2
Total	1650	30.0

Table 3— Distributions of Radiological Diagnoses By Neuroimaging.

Pathology	Radiological Diagnoses of the Patients Undergoing Neuroimaging	Percentage of Patients Undergoing Neuroimaging
Acute ischemia-infarction-bleeding	151	14.3%
Chronic ischemic focus	69	6.53%
Intracranial mass	6	0.56%
Normal	830	78.6%
Total	1,056	100%

emergency department vertigo presentations has a reported range from 0.5%–10% (7). This epidemiological survey was one of the largest ever undertaken in medical literature, which included 406,475 patients scanned, and the results of 5,473 patients aged 60 years or older with vertigo.

The current investigation produced three major findings: 1) most patients with vertigo were discharged for outpatient treatment, 2) life-threatening central pathologies were present in 4.1% of patients with vertigo and 3) although the majority of emergency room visits for vertigo in the elderly population were caused by peripheral vestibular disorders, hypertension and cerebrovascular events were equally prevalent.

Vertigo is generally evaluated either as central or peripheral. In the study by Hain and Yacovino, central vertigo occurred in less than 5% of patients evaluated in the emergency department (8). In our study, we observed central pathology in 225 (4.1%) patients. Thus, when facing patients with vertigo, one must pay attention to the presence of other neurological signs given that life-threatening central pathologies can present with this symptom. The differential diagnosis should, therefore, include assessments for central vertigo and other severe systemic diseases that present with vertigo.

The study conducted by Norrving et al., reported that central pathologies could be missed in older patients at a rate of one in four presenting with acute vertigo attacks (9). Lee's research with 240 patients concluded that 10.4% of those presenting with isolated vertigo and later diagnosed as having a cerebellar infarct, presented with symptoms and signs that mimicked vestibular neuronitis in their history and neurological examination (3). In the study by Son et al., anterior inferior cerebellar artery infarcts were reported to present with vertigo in the context of a normal neurological examination, therefore, making it possible to confuse with peripheral vertigo. Consequently, cranial imaging is recommended for patients at high risk of CVE (10). In the study carried out by Casani et al., the rate of central vertigo that mimicked peripheral vertigo was 2.8%. Therefore, it is important to remember that severe central nervous system pathologies, such as strokes, can mimic peripheral disorders (6,11).

In our study, we observed that 1,056 patients (19.3%) who presented to the emergency department with vertigo underwent CT, MRI, or both. CT scans alone constituted 69% of the radiological imaging performed. According to the study conducted by Braun and Chase, CT scans may not be able to identify early stage ischemic pathologies, instead recommending MRI for patients when vertigo that did not resolve within 48 hours of conservative treatment (12,13).

Although MRI is more valuable for the detection of acute ischemia, its use in the emergency unit is restricted due to its high running costs and the duration of application. We concluded that the lower number of MRIs compared to CT scans in our study was due to these facts.

Details of the patients' medical histories were very useful in the differential diagnoses. Apart from identifying obvious



risk factors, effective questioning of the history of vertigo is essential. In general, vertigo episodes lasting for seconds or minutes suggest a peripheral pathology, while those lasting for hours or days indicate a central pathology (14). However, it is true that the episode can last for days in a peripheral disorder, such as Meniere's disease, and that it can last minutes in central pathologies, such as transient ischemic episodes and migraines (14). Nystagmus is also an important consideration when making a differential diagnosis. While vertical nystagmus suggests central pathologies, horizontal rotatory nystagmus is prominent in the peripheral vestibular failures (3). Meanwhile, the absence of other neurological findings does not exclude a central pathology. Schneider and Olshaker asserted that isolated vertigo can be the only symptom following strokes caused by posterior vascular deficiency (15).

Our finding that 6 patients had intracranial masses on neuroimaging is also worthy of note, and consistent with the findings of De Stefano et al. who found an intracranial mass in 7 of 211 patients followed-up for BPPV (16). Comparable to strokes, intracranial masses can therefore also mimic benign peripheral vestibular pathologies. In light of the data obtained from the high number of patients in this study, we suggest that clinicians have a lower threshold for requesting imaging to prevent severe central pathologies being overlooked.

Severe cardiovascular pathologies, such as MI, can often present with vertigo (17). In our study, 11 patients with vertigo were also diagnosed with MI, while 17 were diagnosed with arrhythmias. Furthermore, vertigo was the only symptom in these 28 patients on initial presentation. Vertigo can be a symptom of main cardiac pathologies, including acute coronary syndrome (ACS) and arrhythmia. Therefore, we suggest that all patients presenting with vertigo undergo electrocardiography.

Systemic or orthostatic hypotension, pre-syncope and syncope can each cause vertigo by reducing cerebral perfusion (18,19). Furthermore, dehydration and electrolyte deficiency can cause vertigo. In our study 96 patients with vertigo (1.5%) were diagnosed with hypotension, 226 were diagnosed with hypertension (4.1%) and 93 (1.6%) were diagnosed with fluid-electrolyte deficiency. By measuring blood pressure and determining fluid-electrolyte levels via simple biochemical tests, treatment can be initiated rapidly.

It is noteworthy that the most common specific infectious disease associated with vertigo was urinary tract infection. However, upper respiratory tract infections are common in patients with a history of vestibular neuronitis, and only the specific diagnosis of vestibular neuronitis may have been recorded in the digital records as a result, thereby potentially explaining the greater number of urinary tract infections. Nevertheless, we suggest that further research is needed to evaluate the relationship between urinary tract infections and vertigo in the elderly.

Anemia can also cause vertigo and other neurological symptoms by causing cerebral hypoxia (20). In our study, 36 patients had anemia and vertigo, with 29 requiring transfusions. Thus, severe anaemia can cause vertigo. The complete blood count, which is inexpensive and simple test, can be very valuable in detecting anaemia. In addition, hypoglycemia, hyperglycemia and insulin fluctuations are associated with vertigo, particularly through neuroglycopenia (21). In our study, 81 (1.4%) and 69 (1.2%) patients with vertigo were additionally diagnosed with hyperglycemia and hypoglycemia, respectively.

The relationship between migraine and vertigo has been demonstrated in various studies. In the epidemiological study conducted by Furman et al., migrainous vertigo had a prevalence of 1% in society (22). Headache is a condition frequently encountered during emergency department visits; however, a disease such as migrainous vertigo, which is common in society, should be considered in the differential diagnosis.

Peripheral vestibular diseases are responsible for most episodes of acute vertigo. BPPV, vestibular neuronitis and Meniere's disease are the most common of these, with BPPV being the most prevalent of all (23). In this study, 632 patients (11.4%) were diagnosed with specific peripheral vestibular diseases. Studies in associated literature report that BPPV can be effectively diagnosed by the Dix–Hallpike maneuver and treated by the Epley maneuver (24,25). Vestibular neuronitis is the second most common peripheral vestibular pathology, and is typically associated with an upper respiratory tract infection. Sudden-onset vertigo that persists without other neurological or audiological findings is the typical presentation. In our study, vestibular neuronitis occurred in 124 patients (2.2%). Meniere's disease occurred in 61 patients (1.1%) with vertigo. With a good history, this can be diagnosed by the characteristic report of tinnitus, vertigo, aural congestion, and fluctuating hearing loss (5).

Vertigo is a symptom of both minor and major disorders. On the one hand, it can be caused by simple metabolic, haemodynamic or peripheral vestibular pathology. On the other hand, it can result from severe cardiac, systemic or neurologic pathologies. Among the elderly population, assessing all cases of acute vertigo as presentations of peripheral vestibular defi-

ciency can lead to missed diagnoses of both readily treated pathologies, including dehydration and hypotension, and serious central pathologies that require further investigation.

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RESEARCH

DEMOGRAPHIC CHARACTERISTICS OF NON-MELANOCYTIC SKIN CANCER: A COMPARATIVE STUDY BETWEEN OLDER AND YOUNGER PATIENTS WHO APLIED TO ANTALYA SERIK STATE HOSPITAL BETWEEN 2008-2013

ABSTRACT

Introduction: Non melanoma skin cancer is the most common cancer in the world that seen more in the geriatric population. We aimed to evaluate the incidence, relationship of gender and location of patients with lesions of head and neck Non melanoma skin cancer who were in geriatric group and aged under 65 years.

Materials and Method: The study included 150 patients diagnosed with non-melanoma skin cancer and operated in Antalya Serik State Hospital between years 2008 – 2013. The patients were separated into 2 groups according to their age (<65 and ≥65). Retrospective evaluation was made in respect of age, gender, lesion's location and pathological diagnosis.

Results: There were 84 (56.0%) males and 66 (44.0%) females (Mean age= 65.51 years). Most patients were in the 6th (n=47) and 7th (n=46) decade of life. Of the 117 patients with diagnosis of basal cell carcinoma, 69 were in the geriatric group and 48 were in the other group and of the 33 patients with diagnosis of squamous cell carcinoma, 22 were in the geriatric group and 11 were in the other group. In the geriatric group, basal cell carcinoma was observed at a higher rate in females and squamous cell carcinoma in males. Non melanoma skin cancer was seen more often on the nose in females and with a lower lip and auricular location in males.

Conclusion: This study, along with the studies that would be conducted in the future in other regions of Turkey, will be useful in determining demographic and geographical characteristics of non melanoma skin cancer that will help in management of these types of cancers.

Key Words: Skin Cancer; Geriatrics; Non Melanoma Skin Cancer; Basal Cell Carcinoma; Squamous Cell Carcinoma.

ARAŞTIRMA

ANTALYA SERİK DEVLET HASTANESİNE 2008-2013 TARİHLERİ ARASINDA BAŞVURAN MALİGN MELANOM DIŞI CİLT KANSERLERİNİN DEMOGRAFİK ÖZELLİKLERİ: GERİATRİK VE GERİATRİK OLMAYAN HASTALARDA KARŞILAŞTIRMALI BİR ÇALIŞMA

ÖZ

Giriş: Non melanom deri kanseri dünyada en sık görülen kanser türüdür ve geriatrik popülasyonda daha fazla görülmektedir. Biz geriatrik ve 65 yaş altı hastalarda baş ve boyun non melanom deri kanseri lezyonlarının insidansını; cinsiyet ve yerleşim yeri ile ilişkisini araştırmayı amaçladık.

Gereç ve Yöntem: Çalışmaya non melanom deri kanseri tanısı olan ve 2008 ile 2013 yılları arasında Antalya Serik Devlet Hastanesi'nde ameliyat edilen 150 hasta dahil edildi. Hastalar yaşlarına göre <65 yaş ve geriatrik grup (≥65 yaş) olarak ikiye ayrıldı. Hastalar yaş, cinsiyet, lezyonun yerleşim yeri ve patolojik tanı açısından retrospektif olarak değerlendirildi.

Bulgular: Hastaların 84'ü (%56,0) erkek, 66'sı (%44,0) kadındı ve ortalama yaş 65.51'di. Hastaların çoğunun yaşamlarının 6. (n=47) ve 7. (n=46) on yılları içinde olduğu görüldü. Bazal hücreli karsinom tanısı olan117 hastanın 69'u geriatrik yaş grubunda ve 48'i geriatrik olmayan grupta yeralırken; skuamöz hücreli karsinom tanısı olan 33 hastanın 22'si geriatrik yaş grubunda iken 11'i 65 yaş altı grubta yeralmaktaydı. Geriatrik grupta, bazal hücreli karsinom kadınlarda daha sık görülürken; skuamöz hücreli karsinom erkeklerde daha yüksek oranda gözlendi. non melanom deri kanseri kadınlarda burunda daha sık görülüyorken erkeklerde alt dudak ve kulakta daha sık görülmekteydi.

Sonuç: Non melanom deri kanserinin epidemiyolojik ve demografik özelliklerinin anlaşılması bu tür kanserlerin tedavisinde yardımcı olacaktır. Bu çalışma, Türkiye'nin diğer bölgelerinde gelecekte yapılacak olan çalışmalarla birlikte NMSC'nin demografik ve coğrafik özelliklerinin belirlenmesinde yararlı olacaktır.

Anahtar Sözcükler: Cilt Kanseri; Geriatri; Melanom Dışı Deri Kanseri; Bazal Hücreli Karsinom; Skuamöz Hücreli Karsinom.

Introduction

Aging is an inevitable process that occurs in all living organisms. After middle age, some effects of aging can be most commonly observed on the skin. The process of aging is influenced by intrinsic (chronic skin aging) and extrinsic (photo-aging) factors. Intrinsic aging is a natural, physiological process encoded in the genome. This process occurs irrespective of environmental factors; however, such factors may initiate the process earlier, accelerate it, or increase it. Photo-aging develops because of the effects of the sun. Changes induced via other environmental factors, such as cold, wind, reduced humidity, alkaline soap, use of poor cosmetics, and smoking, can be at least partially prevented (1-3).

A significant increase in life expectancy has been attributed to improvements in living conditions and the continued development of new therapeutic alternatives. Furthermore, a decrease in birth rates has resulted in the elderly (those ≥65 years) constituting a greater proportion of the general population. According to the Statistics Institute of Turkey, 4.2% of the general population was elderly in 1985, and that rate had risen to 8% in 2014 (4). Because of the increased lifespans, the incidences of age-related diseases including cancer have increased (3,5).

As the population ages, a more complete understanding of the clinical and histopathological features unique to the geriatric dermatology patient is essential because malignant lesions of the skin are common, particularly in older patients. Sites around the face, head, and neck account for up to 75% of all skin malignancies (6).

Skin cancers are categorized into two groups: melanomas and non-melanoma skin cancers (NMSCs). Non-melanoma skin cancer is the most common form of cancer worldwide, constituting approximately 40% of all malignancies (7). Furthermore, it represents approximately 95% of all cutaneous neoplasms. The incidence of NMSC has increased since the 1990s (7).

Timely recognition and diagnosis are important because early identification can limit the extent of facial tissue involvement and subsequent resection, which provides for better cosmetic and functional reconstructions. Therefore, the aim of this study was to retrospectively evaluate the incidence of head and neck NMSC, and its relationship with gender and lesion location in geriatric and non-geriatric populations residing in the Antalya Serik Region of Turkey, a Mediterranean area that receives abundant sunlight.

Materials and Methods

This study included 150 patients diagnosed with NMSC and operated on at Antalya Serik State Hospital between 2008 and 2013. Retrospective evaluation data were patient age, gender, lesion location, and pathological diagnosis. Patients were separated into two age groups, those <65 years (non-geriatric; range, 28–64) and those ≥65 years (geriatric group; range, 65–87). The incidence of NMSC and the most frequently observed subgroups of basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) were compared between the two groups. The distribution of the tumors in each decade of life was also examined.

Lesions were categorized according to their location (forehead, nose, lower lip, upper lip, eye area, eyelid, cheek, auricular, and neck). The distribution percentages were compared separately according to the lesion site, age group, and gender.

Statistical Analysis

The data obtained from the study were analyzed using SPSS v. 20 software (SPSS Inc., Chicago, IL, USA). Nominal variable differences between the groups were examined using chi-square analyses. Values seen in 2¥2 tables at>25% or <5% were evaluated with Pearson's chi-square test with Monte Carlo simulation from the Fisher's exact test and RxC tables. For interpretation of the results, a value of $p<0.05$ was accepted as statistically significant.

Results

The 150 patients operated on for NMSC included 84 (56%) men and 66 (44%) women with a mean age of 65.51 years (range, 28–87, median 66). Lesions were diagnosed as BCC in 117 (78%) patients and as SCC in 33 (22%) patients.

A diagnosis of NMSC was made in 59 and 91 patients of in the non-geriatric and geriatric groups, respectively. When patients were evaluated regarding their decade of life, most were observed to be in their sixth (n=47) or seventh (n=46) decade.

Of the 117 patients with a diagnosis of BCC, 48 (41%) and 69 (59%) were in the non-geriatric and geriatric age groups, respectively. Of the 33 patients with a diagnosis of SCC, 11(33.3%) and 22 (66.7%) were in the non-geriatric and geriatric groups, respectively.

The distribution of NMSC according to the gender is as follows: in women 87,9% was BCC and 12,1% was SCC; in men 70.2% was BCC and 29,8% was SCC. These results de-

Table 1— Frequency of NMSC and Relationship With Location and Gender.

		Men		Women		Total		Chi-square analysis	
		n	%	n	%	n	%	Chi-square	p Value
NMSC	BCC	59	70.2	58	87.9	117	78.0		
	SCC	25	29.8	8	12.1	33	22.0	5.714	0.017
	Total	84	100.0	66	100.0	150	100.0		
Tumor location	Forehead	5	6.0	6	9.1	11	7.3		
	Ear	15	17.9	3	4.5	18	12.0		
	Eye area	3	3.6	2	3.0	5	3.3		
	Eyelid	-	-	3	4.5	3	2.0		
	Upper lip	2	2.4	1	1.5	3	2.0	*	0.034
	Lower lip	9	10.7	3	4.5	12	8.0		
	Neck	4	4.8	1	1.5	5	3.3		
	Nose	27	32.1	33	50.0	60	40.0		
	Cheek	19	22.6	14	21.2	33	22.0		
	Total	84	100.0	66	100.0	150	100.0		

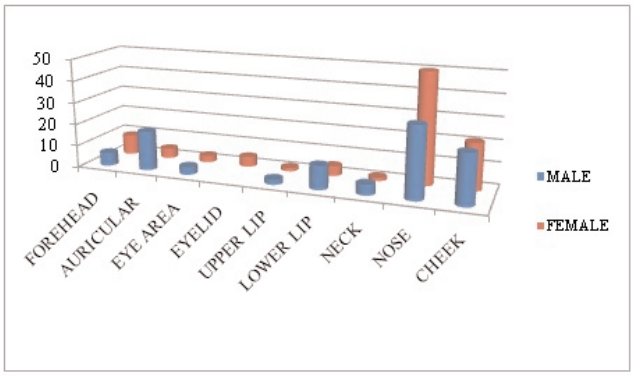


Figure 1— Distribution of NMSC location according to gender.

monstrated that BCC was seen more often in women, and that SCC was seen more often in men. A statistically significant relationship was detected between NMSC and gender ($p<0.05$; Table 1). In the geriatric group, BCC was observed at a higher rate in women (87.5%) and SCC at a higher rate in men (37.2%). In the non-geriatric group, BCC was also observed at a higher rate in women and SCC in men; however, these differences did not reach the level of statistical significance ($p > 0.05$).

Regarding tumor location, NMSC was more frequently observed on the nose in women and on the lower lip or auricular region in men (Table 1; Figure 1). A statistically significant relationship was detected between tumor location and gender ($p < 0.05$). The same results were obtained in the geriatric group; however, no relationship was detected between tumor location and gender in the non-geriatric group.

While BCC was more frequently observed on the nose, cheek, forehead, eye area, and eyelid, SCC was found more often on the ear and lower and upper lips ($p<0.05$; Table 2; Figure 2). These results were detected only in the geriatric group, as no statistically significant relationship between tumor location and gender could be detected in the nongeriatric group ($p>0.05$; Table 3).

Discussion

Chronological changes that affect the structure and function of human skin occur with aging. Progressive thinning and decreased cell replacement of the epidermis, increased blood vessel fragility, dryness, and reduced wound healing are all age-related changes. Furthermore, the numbers of melanocytes, fibroblasts, and Langerhans cells are decreased, causing changes in skin pigmentation, elasticity, and barrier function (2,3). Extrinsic changes may result from factors including ultraviolet light exposure and environmental pollutants, such as smoking. A variety of skin changes have been seen in aged skin due to prolonged exposure to the sun. Sun exposure contributes to a decline in dermatological integrity, leading to skin that easily sags, breaks, bruises, and itches. (1) All these changes contribute to a vulnerability to dermatological disorders. These disorders encompass a diverse array of

Table 2— Results of the Chi-Square Analysis of the Relationship Between Tumor Type and Tumor Location.

	BCC		SCC		Total		Chi-square analysis	
	n	%	n	%	n	%	Chi-square	p Value
Forehead	9	7.7	2	6.1	11	7.3	*	0.041
Ear	11	9.4	7	21.2	18	12.0		
Eye area	4	3.4	1	3.0	5	3.3		
Eyelid	3	2.6	-	-	3	2.0		
Upper lip	2	1.7	1	3.0	3	2.0		
Lower lip	5	4.3	7	21.2	12	8.0		
Neck	4	3.4	1	3.0	5	3.3		
Nose	51	43.6	9	27.3	60	40.0		
Cheek	28	23.9	5	15.2	33	22.0		
Total	117	100.0	33	100.0	150	100.0		

*When the values were >25% or <5% of the anticipated values, Pearson's chi-square analysis with Monte Carlo simulation was applied.

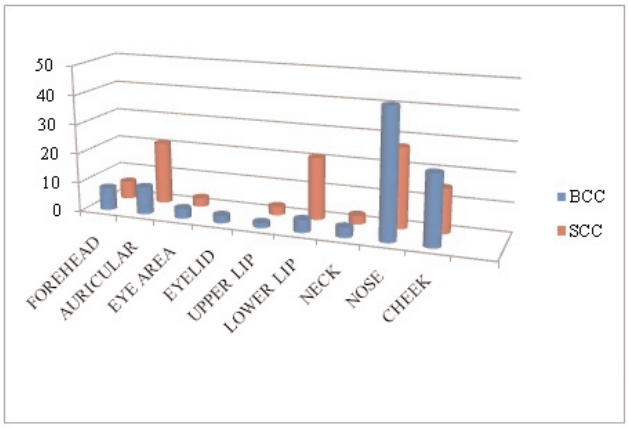


Figure 2— Distribution of SCC and BCC locations.

etiologically unrelated degenerative, autoimmune, idiopathic, and neoplastic conditions that may impact quality of life and produce significant morbidity and mortality.

Non-melanoma skin cancer is the most common form of malignancy affecting Caucasians, represents nearly 95% of all cutaneous neoplasms (8), and is increasing in worldwide incidence. Australia has the highest incidence of skin cancer in the world, with a population-based cancer registry showing that this cancer type has increased 1.5-fold over the past 17 years (9). Basal cell carcinoma accounts for 75%–80% of NMSCs, and up to 75%–80% of these are on the head and neck. The remainder is predominantly SCC (10,11,12). In the current study, BCC was diagnosed in 78% (n=117) of patients and SCC in 22% (n=33). Furthermore, NMSC was more frequently observed in the geriatric population. In a study of a patient group aged >60 years conducted by Sentis et al., BCC was diagnosed in 90% and SCC in 83%. Results from studies conducted in Italy, Australia, Spain, and England suggest that the mean age at which NMSC was detected was in the seventh decade of life (9.13-15). In the current study, the mean age was 65.5 years (median, 66). Of the patients diagnosed with BCC, 68.4% were aged >60 years, and 75.8% of those in the same age group were diagnosed with SCC. A significant increase was observed in NMSC from the age of 50 or more years, and the largest group was found to be those between 60 and 70 years of age (Figure 3).

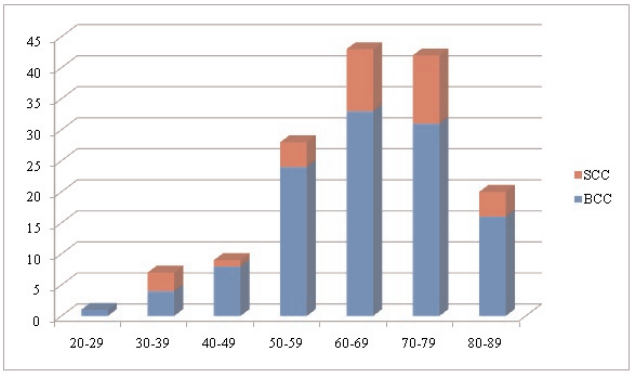


Figure 3— Distribution of SCC and BCC according to decades.



Although there was a predominance of NMSC in the geriatric age group, it was seen at an earlier age as compared with the results of studies from several Mediterranean countries, Australia, England, and the United States (9,11,13-15). This finding from the current study is supported by the results of studies previously conducted by Eskiizmir et al. and Tiftikcioğlu (12,16). The current study was conducted in the region of Antalya, Turkey, with the highest rate of sunlight. Therefore, the majority of the study participants had been exposed to very high levels of sunlight as they worked in agriculture in rural areas of Antalya. Although there are studies reporting higher rates of NMSC in men than in women (9,11), there are also studies stating that there is no significant difference (10,12,13). In the current study, the men/women ratio was 1.27/1. This may be due to the fact that men work in agricultural field more than women in Serik.

The greatest risk factor for the development of BCC is exposure to ultraviolent radiation (1). This explains geographical variance and why the disease is more common in areas of the body exposed to the sun. The extent of sun exposure in childhood is especially important (1). The area of high recurrence rate as the H zone, which is at high risk because of both functional and cosmetic importance. The anatomical areas at high risk of invisible tumor spread are the nose, ear, eyelid, eyebrow, and temple. Seretis et al. determined that the most common locations of NMSC were the nose and cheek. The most common location of SCC is the lower lip (61%), and those of BCC are the nose (30.4%) and cheek (25.6%) (11). In previous studies, Eskiizmir et al. suggested that the most common locations of BCC and SCC were the nose and lips (16), respectively, and Serdar Yuce et al. reported that BCC was most frequently localized on the nose and SCC on the malar and auricular regions (10). In the current study, BCC was observed more frequently in the nose and cheek areas, while SCC was found more often in the auricular region and lower lips. While the aforementioned results were obtained in the geriatric group, no statistically significant relationship was detected between tumor location and gender in the nongeriatric group ($p>0.05$). When tumor location was evaluated according to gender, the most common location of NMSC in both genders was the nose, although the rates of this lesion location were found to be 50% in women and 32.1% in men. Auricular location was more frequent in men (17.9%) than in women (4.5%), as was the lower lip (10.7% vs.4.5%). Jennifer M et al. also found that men were much more likely to develop NMSC on the ear than woman, and that SCC was more common than BCC (17). This finding may be attributed to the more frequently covered ears of women, as they may cover them with hair or the local custom of women wearing a headscarf. In men, the auricular region may be the most unprotected.

In conclusion; although NMSC is encountered in Turkey more frequently in geriatric patients, it is observable at earlier ages as compared with other Mediterranean countries. Basal cell carcinoma was more frequent in the women population, while SCC was encountered more frequently in the men population. BCC was observed most commonly from lesions in the nose and cheeks, while the lower lips and auricula were observed to be at higher risk in men with regard to NMSC as compared with women.

Further elucidation of the epidemiological and demographic characteristics of patients with NMSC may serve to assist in preventing and curing these types of cancers. Although the current study does not cover Turkey as a whole nation, it remains significant, as it demonstrates the characteristics of NMSC in the sunniest regions of Turkey. The results of the current study, in conjunction with anticipated future studies conducted in other regions of Turkey, may prove useful in determining the ecological and geographical characteristics of this disease.

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RESEARCH

A QUALITATIVE STUDY OF ELDERS' VIEWS ON MEDICINE USAGE

ABSTRACT

Introduction: Within many studies little attention has been paid to elders' ideas about medicines. This qualitative study set out to explore the experiences of elderly requiring chronic treatment.

Materials and Method: Four focus groups were conducted with 27 participants aged 65-88 years. Interviews were taped, transcribed, and coded by two independent researchers, who identified major themes by relevance.

Results: The main themes emerging from the analyses were: perceived properties of drugs; proper usage of drugs and experience of drug usage.

Participants described these in their words as;

'Everybody has a disease, but I am a drug addict; I have used drugs all my life'.

'I'm not worried about taking them, mostly because if they're going to kill me earlier I don't care because I just want to get rid of the problem'.

'I don't know the names; I recognise them looking at their sizes and colours'.

'I need to get a continuous way, but sometimes I do not. If I forget to drink I take it after I remember'.

Conclusion: To understand elderly' experience and behaviors helps to meet their medication related needs and can avoid problems due to improper drug usage.

Key Words: Elderly; Use of medication; Medication experience.

ARAŞTIRMA

YAŞLILARIN İLAÇ KULLANIMI HAKKINDAKİ GÖRÜŞLERİ ÜZERİNE NİTELİKSEL BİR ÇALIŞMA

ÖZ

Giriş: Birçok çalışma kapsamında yaşlıların ilaç kullanımları hakkında düşüncelerine az dikkat gösterilmiştir. Bu niteliksel çalışma, kronik tedavi gerektiren yaşlıların ilaç kullanım deneyimlerini araştırmak için tasarlanmıştır.

Gereç ve Yöntem: Yaşları 65-88 arasındaki 27 katılımcı ile dört odak grup oturumu yürütülmüştür. Görüşmeler, kayda alınarak iki bağımsız araştırmacı tarafından ana temayla ilgili olarak çözümlenmiş ve kodlanmıştır.

Bulgular: Yapılan analizler sonucunda ana temalar; ilaçların algılanan özellikleri, ilaçların doğru kullanımı ve ilaç kullanım deneyimleri olarak belirlenmiştir.

Katılımcılar bu durumu aşağıdaki sözleriyle ifade etmişlerdir;

'Herkesin bir hastalığı var, ama ben ilaçlarla yaşıyorum ve ömür boyu kullanmak zorundayım'.

'Ben, onları almak hakkında endişeli değilim, çünkü eğer onlar beni erken öldüreceklerse umurumda değil ben sadece sorunun geçmesini istiyorum'.

'...isimlerini bilmem; onları boylarına bakarak ve renklerine göre ayırıyorum'.

'Benim sürekli bir şekilde kullanmam gerekiyor, ama bazen yapamıyorum. İçmeyi unutursam hatırladığımda alıyorum'.

Sonuç: Yaşlıların ilaç kullanım davranış ve deneyimlerini anlamak onların ilaçlarla ilgili gereksinimlerini karşılamaya yardımcı olur ve uygunsuz ilaç kullanıma bağlı sorunların önüne geçilmesini sağlar.

Anahtar Sözcükler: Yaşlı; İlaç Kullanımı; İlaç Deneyimi.

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Introduction

With increasing life expectancy, the probability of multiple comorbidities in an individual also increases. This often results in polypharmacy. Indeed, research suggests that most elderly people now use three or more drugs each day, often for 5 years or longer (1-3). Similar results have been obtained for Turkey (4-6). This situation increases the likelihood of unwanted drug side effects and drug–drug interactions, thereby complicating the treatment. It has also been stated that polypharmacy increases the rate of medication compliance problems, which further increases the risk of adverse effects (7-9). Older adults often seek care from different physicians; in clinical practice, one clinician could be unaware of the medication recommendations made by another, which could lead to unintentional polypharmacy (4, 9). Moreover, the elderly often have limited knowledge about their drugs and can have poor compliance, which can also increase the risk of adverse effects (10-13).

Although medication self-management is essential to drug safety, particularly in older people, it remains a challenging issue. Despite adequate information from doctors and the use of patient information sheets, older patients can face problems in understanding their medication regimens, and despite the use of pillboxes, older patients can often have difficulty remembering to take their medications (14). Adherence to medication regimens is an important factor in effective treatment. Awareness of the problems that elderly patients experience while using drugs, and that affect their treatment compliance, can help prevent problems. Relevant problems associated with incorrect amount of doses and dosage regimens include adverse/toxic effects, unnecessarily prolonged treatment and failure to achieve adequate therapeutic response (15–17).

Diminished functions and loss of sense with age might lead elderly to use drugs incorrectly (7,-9, 18). Several factors can bring about medication compliance problems and usage difficulties in the elderly, including a decline in cognitive and functional capacity, different levels of knowledge, expectation and satisfaction, the quality of communication with the doctor and diminishing visual acuity and manual skills. Taken together, these situations can result in medication non-compliance (7–9, 11,13).

It is thought that one in four elderly patients take medication breaks (stop their medications) because they are not sufficiently aware of the importance of regular drug intake (7, 15, 19). Studies have been conducted to identify the factors associated with polypharmacy and compliant drug use in the elderly. It is known that the attendant risks can be reduced by patient education and physician education, but that continued monitoring of the use and requirement of medication is essential (10–13,19,20).

Several researchers have studied medication and treatment compliance and on the associated side effects, but few have studied the problems that the elderly face when using medications by means of concerning their opinions. A few studies have reported that the elderly have trouble with treatment compliance and the correct use of drugs (21–24). In light of this literature, we aimed to explore the experiences of elderly patients requiring chronic treatment.

Materials and Method

We conducted a qualitative study of four focus groups each consisted of 7–8 participants with a total of 27 participants (2 women and 15 men) aged 65–88 years recruited by purposive sampling. We asked them about the drugs that they have to use because of their chronic diseases, their experiences and their opinions about the health care they receive. The questions based on the literature (7,9,11,14,18,24).

The following questions were addressed to the group during the focus group study:

1. Can you explain what your experience is of using drugs? How does continuous drug use affect your life? Which things do you think are affected?
2. Do you experience difficulties? What type of difficulties are they?
3. How do you distinguish between the drugs? How do you remember when you have to take them?
4. Do you ever forget to take drugs? Do you ever skip taking one?
5. Have you ever experienced side effects from the drugs you use? Do you think you are addicted to the drugs?
6. Is drug use a limiting issue for you? Is it important to you?

The time period of the focus groups ranges between 75-125 minutes for each focus group.

The goal of qualitative phenomenological research is to describe the 'lived experience' of a phenomenon. The focus group interviews were recorded through a voice recorder and transcribed verbatim. Data collection and analysis were performed simultaneously by two independent researchers and the analysis of transcripts was initiated as soon as they were



collected: we used theoretical sampling that involved simultaneously collecting, coding and analysing data and then deciding what data to collect before developing the phenomenology study.

Coding data by the data reduction method produced codes (typically words or features) to identify the themes for qualitative research. The phenomenological data analysis used a strategy that allowed the method of analysis to reach and create the nature of the data itself. To determine the essential meaning of an experience, we used abstract themes to explain and search for the relations between the individuals and the thing that they aimed to learn or understand. Theoretical sampling continued until the categories of the substantive theory were saturated. Analysis of the data involved open, axial and selective coding.

The first step was to name and give meaning to the open data coding before comparing the codes to the other contents; similarities or differences were then subsequently grouped to form categories. Axial coding followed open coding. Three conceptual categories were created through the process of developing the main categories. This process was used to make connections between categories and subcategories and to allow a conceptual framework to emerge. Selective coding was then used to link all categories and subcategories to the core category. The core category was defined as the central category that linked all the data and accounted for variations in the data.

Table 1— Characteristics of the Participants

Age (Mean±sd) (Min-Max) year	73.19±6.72 (65-88)
Gender n (%)	
Female	12 (44.4)
Male	15 (55.6)
Education n (%)	
Primary school	17 (63.0)
High school	10 (37.0)
Self-reported income level n (%)	
Low	14 (51.8)
Middle	13 (49.2)
Self-reported chronic conditions (n)	
Hypertension	24
Diabetes mellitus	9
Cardiovascular disease	9
Cerebrovascular disease	9
Number of prescription medications	
Mean±sd	4.81±2.81
Range	1 to10
Number of people at home	
Mean±sd	2.04±0.64
Range	1 to 4
Having caregiver n (%)	
Yes	1 (3.7)
No	26 (96.3)

Approval was obtained from the Ethics Committee of Dokuz Eylul University Medical Faculty. The investigation conformed to the principles outlined in the Declaration of Helsinki. Participants were informed of the purpose and nature of the study and were assured that their data would be kept confidential and that their participation was voluntary and they could withdraw from the study at any time without any effect on the care they were receiving. Once the participants had verbally agreed to take part, their written consent was obtained.

RESULTS

In our study, the focus group the mean age of elderly was 73.19 ±6.72 years. Most had been educated to at least primary school level, belonged to the middle-income class, had no caregivers and cohabited. The average daily drug intake was 4.81. The patient characteristics are summarised in Table 1.

Our primary expectation was that problems would occur with understanding medications, their regimens and compliance and that patient may have difficulties in reading drug labels or opening packaging. In addition, we expected to see evidence of forgetfulness in drug usage. The statements of the participants in this study confirmed these expectations and were consistent with the findings of previous research. The three main themes specified in our analyses were as follows: the perceived properties of drugs, using drugs properly and the experience of drug usage. To supplement this, examples of subcategories, categories and themes observed in older patients' views on medicine use are shown in Table 2. The participants expressed themselves within the framework of these main themes.

Perceived Properties of Drugs

The involvement of the elderly in the treatment of disease may become easier if they internalise the perceived properties of drugs. Taking responsibility for their treatment could also improve compliance. Therefore, it is of great importance that individuals have an idea about the properties of drugs if they are to continue using them, even though these problems may arise among older patients in terms of both understanding

Table 2— Examples of Subcategories, Categories and Themes About Older Patients' Views on Medicine Usage.

Informant Data	Categories	Theme
'You have to get accustomed to it. Once you get accustomed, there will be no problems. If the balance is disturbed, all of you did will disappear'	Knowledge about properties of drugs	Perceived properties of drugs
'Since it is an incurable disease, I have to use it 'till I die'	Acceptance of drugs	
'....of course I try to balance it in the morning and in the evening but I try to reduce it as much as possible when I feel good'	Drug compliance	Proper usage of drugs
'I don't know the names; I recognise them looking at their sizes and colours	Using habits of drugs	
'I need to get a continuous way, but sometimes I do not. If I forget to drink I take it after I remember'	Own life happenings about drug usage	Experience of drug usage
'I am used to carrying them with me. I don't forget them often. You try to take them regularly afterwards'	Effort and exertion about drug usage	

and implementing the treatment. In our study, patients expressed this issue as follows:

'Everybody has a disease, but I am a drug addict; I have used drugs all my life'.

'Therefore, it's four a day; three plus a painkiller. We also take these without difficulty; each has a healing effect'.

'You have to get accustomed to it. Once you get accustomed, there will be no problems. If the balance is disturbed, all of you did will disappear'.

'I can't walk if I don't take painkillers, yet the drugs don't agree with my stomach. I first take a pill to protect my stomach in the morning'.

'The doctor has to adjust the dosage considering my constitution'.

'Since it is an incurable disease, I have to use it 'till I die'.

Rationale Usage of Drugs

Elderly patients sometimes reacted to their treatment by not taking any drugs or by taking too many drugs. About half of the patients did not comply with their prescribed dosage. Treatment compliance was affected by cognitive disorders, unacceptable side effects, difficulties obtaining repeat prescriptions, high costs, complicated dosage regimens, lack of faith in the treatment and breakdowns in the doctor–patient relationship. The following are representative examples:

'I have been using some nervines for 4–5 months, but I have given up using them'.

'I'm not worried about taking them, mostly because if they're going to kill me earlier I don't care because I just want to get rid of the problem'.

'....of course I try to balance it in the morning and in the evening but I try to reduce it as much as possible when I feel good'.

'...we take it afterwards when we forget. I want the drug, my cholesterol drug strains me ... I'm OK, but it constantly strains me'.

'I don't know the names; I recognise them looking at their sizes and colours'.

'I have a cupboard for the drugs. I have separate boxes in the cupboard. The names of each box are written separately on cards stuck on boxes. I go and buy whichever one depletes'.

'...in order not to mix them up... in fact there are eight, but I don't remember now. It can be found in pharmacies; maybe one of you has used it before that little box with four parts ... for the morning, noon, evening, etc. I put the pills in it. If I see a pill, I understand that I have forgotten to take it and so I take the pill. I came up with this solution'.

'I use so many drugs that I can't remember the names. I have a bag that I took from the pharmacy. I put all my drugs into it; I have to take it with me wherever I go'.

'There are lists in my bags, room and kitchen'.

'...no, I put them in order. There are different colours and names on them; I distinguish between them by these differences. I use them constantly'.

'...of course, they are next to my bed, together, in a bag. I have a bag in the cupboard, somewhere I can always reach'.



Experience of Drug Usage

Elderly individuals with chronic diseases usually continue on long-term drug therapies at home. However, they can inadvertently use incorrect dosages for a variety of reasons. For example, they can forget to take them because of declining sensory functions and the need to use more than one drug, which complicates their treatment. Also, they might not understand the importance of their drug therapy and could be put off by side effects like sickness and vomiting. In this study, patients expressed their opinions as follows:

'I need to get a continuous way, but sometimes I do not. If I forget to drink I take it after I remember'.

'The drugs I take are incalculable. I take drugs in the evening. I think I have reflux or something like that. The drugs made me almost vomit. It was like poison. Even though I drank a bottle of water, the bitter taste didn't disappear. I don't know. I am not happy with these drugs. I don't like taking them; I take them with difficulty'.

'I am used to carrying them with me. I don't forget them often. You try to take them regularly afterwards'.

In the introduction, we stated that the increasing rate of comorbidities in the elderly, coupled with the increasing number of treatments and declining cognitive and functional capacity, are resulting in problems understanding drug therapy and being compliant with it. Medication compliance refers to the degree to which a given patient follows a prescribed treatment schedule and is related to numerous factors. These factors include the patient's knowledge of the drug and his or her memory, expectations and satisfaction, as well as the quality of communication with the doctor. Thus statements of participants outline similar expressions. Also according to a qualitative research results medications are viewed as a necessary, often unquestioned, the overall medication experience is positively or negatively influenced by the doctor patient relationship and the assumption that it is the physician's role to communicate medication information. And they stated that elders have a lack of insight regarding the complexities of the medications they are taking and their medications connection to their chronic health challenges (25). We also found that forgetfulness was a problem that was commonly expressed by our participants. Our study is consistent with previous reports that the elderly often have inadequate knowledge of drugs that can lead to non-compliance and increased side-effect burdens. Some of the patients in our study distinguished between drugs by looking at their colours and ignoring other properties, which was not ideal. Programs need to focus on improving the ability of elderly patients to use drugs correctly, but this will require good communication between patients, relatives and doctors (12). Drug compliance could be helped by providing lists or individualised labelling to prevent drugs being mixed up or used improperly. Such individualised patient care and patient training could facilitate the participation of patients in their own treatment, thereby increasing their independence (17).

This study provides useful insights into the hidden doubts and complexities experienced by older people. Doctors need to ensure that older adults adhere to their medication by assessing their medication-related behaviours. This assessment should ensure that drugs and other nutritional supplements are both appropriate for the identified health problems and that their patients are aware of the need for them. Management strategies need to focus on providing clear and reliable information on side effects and drug interactions in a manner that patients can understand. They should also facilitate communication between patients and doctors and should provide patients with the ability to disclose concerns about medication to different clinicians.

CONCLUSION

As a first step toward the assessment of drug usage among elderly patients, doctors need to become familiar with each individual and their unique environment through home visits and medication reviews. Every opportunity must be taken to prevent mistakes with drug usage, notice errors early and take necessary precautions.

Limitations

Our study has some limitations. Firstly, it will be known that the nature of the study does not allow us to determine causality. The sampling strategy used in our study was stated purposive and therefore cannot be considered representative for means of larger population. According to qualitative research tradition, this study does not purport to offer findings that are objective, representative or generalizable. Second, the results of the study may have been affected by personal statements. Further research will be used to quantify the perceptions expressed by the participants in our study.

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Conflict of Interest

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RESEARCH

THE CORRELATION OF CHOROIDAL THICKNESS AND OCULAR PULSE AMPLITUDE IN NON-EXUDATIVE AGE-RELATED MACULAR DEGENERATION

ABSTRACT

Introduction: The choroid is involved in the pathogenesis of various retinal diseases, including age-related macular degeneration (AMD). The ocular pulse amplitude (OPA) gives useful information about intraocular blood flow and is an indirect indicator of choroidal perfusion. In this study, we aimed to assess the correlation between the OPA and choroidal thickness (CT) in the eyes of healthy individuals and of individuals with non-exudative early stage AMD.

Materials and Method: Fourty-four eyes of 44 non-exudative AMD patients and 41 age-matched eyes of 41 healthy individuals were included in the study. All eyes underwent a detailed ophthalmic evaluation, including axial length (AL) and ocular pulse amplitude (OPA) measurements. The CT was measured using optical coherence tomography. Parameters were compared between the two groups and correlation between OPA and CT was assessed.

Results: The mean subfoveal, foveal,and parafoveal CT were 245.82±24.29µm, 230.66±23.44µm, 219.55±25.39µm in AMD group, respectively. The corresponding values were 278.44± 34.18µm, 263.76±32.45µm, and 253.79±34.81µm in control group, respectively. The mean ages of groups were 69.6±8.97 years, and 65.0±5.89 years, respectively. The mean OPA was 3.43±1.14mmHg and 3.49±1.12mmHg , respectively. The average CT in AMD patients were significantly lower than the control group in all three regions (subfoveal- foveal- parafoveal) (all p<0,001). In controls, there was a moderate positive correlation between the OPA and CT in the three segments (p=0.002, 0.009, and 0.003; respectively). However only the foveal CT showed significant positive correlation with the OPA in AMD group (p=0.047).

Conclusion: Our results showed a considerable correlation between ocular pulse amplitude and choroidal thickness in healthy subject. In non-exudative AMD group, there was a weak correlation between them. It can be hypothesized that; in patients with AMD, degeneration and/or thinning of choroidal pattern is a reason for this result.

Key Words: Choroidal Thickness; Ocular Pulse Amplitude; Dynamic Contour Tonometry; EDI Mode Optical Coherence Tomography.

ARAŞTIRMA

NON-EKSUDATİF YAŞA BAĞLI MAKULA DEJENERASYONUNDA OKÜLER NABIZ AMPLİTÜDÜ VE KOROİD KALINLIĞININ KORELASYONU

ÖZ

Giriş: Koroid tabakası yaşa bağlı makula dejenerasyonunu (YBMD) da içeren birçok retinal hastalığın patogenezinde yer alır. Oküler nabız amplitüdü (ONA) ise intraoküler kan akımı hakkında bilgi verir ve koroidal perfüzyonun indirekt göstergesidir. Bu çalışmada sağlıklı gözler ve YBMD olan gözlerde ONA ve koroid kalınlığını (KK) değerlendirmeyi ve kıyaslamayı amaçladık.

Gereç ve Yöntem: Kırkdört YBMD hastasının 44 gözü ile, yaş uyumlu 41 sağlıklı katılımcının 41 gözü çalışmaya dahil edildi. Aksiyel uzunluk (AU) ve ONA ölçümünü içeren kapsamlı oftalmik muayene yapıldı. Optik koherens tomografi cihazı ile KK ölçüldü. Parametreler iki grup arasında kıyaslandı ve KK ile ONA arasındaki korelasyon değerlendirildi.

Bulgular: Yaşa bağlı makula dejenerasyonunu grubunda ortalama koroid kalınlıkları subfoveal, foveal ve parafoveal alanlarda sırasıyla 245.82±24.29µm, 230.66±23.44µm, 219.55±25.39µm iken, kontrol grubunda sırasıyla 278.44±34.18µm, 263.76±32.45µm ve 253.79±34.81µm idi. Ortalama yaş YBMD grubunda 69.6±8.97; kontrol grubunda 65.0±5.89 yıl idi. Ortalama ONA iki grup için sırasıyla 3.43±1.14 mmHg ve 3.49±1.12 mmHg olarak ölçüldü. Ortalama KK tüm bölgelerde (subfoveal-foveal-parafoveal) YBMD grubunda kontrol grubuna kıyasla anlamlı düzeyde düşüktü (p<0,001). Kontrol grubunda ONA ile KK arasında her üç bölgede de anlamlı pozitif korelasyon varken (p=0.002, 0.009, 0.003), YBMD grubunda sadece foveal KK ile ONA arasında ilişki saptandı (p=0.047).

Sonuç: Sonuçlarımız sağlıklı grupta KK ile ONA arasında dikkate değer bir korelasyon olduğunu gösterdi. Non-eksudatif YBMD grubunda ise zayıf bir korelasyon mevcuttu. YBMD hastalarında koroidal paterndeki dejenerasyon ve/veya incelme bu korelasyonun bozulmasının sebebi olabilir.

Anahtar Sözcükler: Koroid Kalınlığı; Oküler Nabız Amplitüdü; Dinamik Kontür Tonometre; EDI Mod Optik Koherens Tomografi.

Introduction

The choroid is known to have an important role in ocular nutrition, volume regulation, and temperature control (1). Furthermore, it is involved in the pathogenesis of various retinal diseases, including age-related macular degeneration (AMD) (2,3). Age-related macular degeneration is characterized by changes in retinal pigment epithelium (RPE) and Bruch's membrane, which are both fed by choroidal blood flow. Therefore, choroidal vascular insufficiency may lead to AMD (4).

Adequate visualization and assessment of the choroid was not possible until the development of techniques such as partial coherence interferometry and spectral domain optical coherence tomography (SD-OCT) that permit measurements of the living choroid (5). The recent development of enhanced depth imaging (EDI) has now made choroidal examination using SD-OCT even more precise (6).

The ocular pulse amplitude (OPA) gives useful information about intraocular blood flow and is an indirect indicator of choroidal perfusion (7,8). Dynamic contour tonometry (DCT) is a contact tonometer that measures intraocular pressure (IOP) independently of central corneal thickness and corneal curvature. Interestingly, Mori et al. found that ocular blood flow and OPA were lower in patients with exudative AMD than in those with non-exudative AMD and controls. Therefore, it was suggested that reduced choroidal blood flow contributes to the development of choroidal neovascularization in AMD (9).

In this study, we aimed to assess the correlation between the OPA and choroidal thickness in the eyes of healthy individuals and of individuals with non-exudative early stage AMD.

Materials and Method

This prospective, comparative study was approved by the Ethical Review Committee of Ufuk University and adhered to the provisions of the Declaration of Helsinki for research involving human subjects. Written informed consent was obtained from all participants. In total, we included 44 eyes of patients with non-exudative AMD and 41 eyes of age- and- sex matched individuals in the study. The following criteria were used for inclusion in the AMD group: extensive (>15) small drusen; a few (<20) medium-size drusen with soft borders; numerous (≥20 with soft borders, but ≥65 with distinct boundaries) medium-size drusen; or pigment abnormalities (e.g. increased pigmentation or depigmentation, but not geographic atrophy). The following eligibility criterion was used for inclusion in the control group: aged 55 years or older with eyes considered normal by funduscopy and OCT. For both groups, we excluded the following: eyes with known ocular diseases, including glaucoma, uveitis, diabetic retinopathy, and a history of previous intraocular surgery or injection; eyes with refractive errors of 6 D or more as spherical equivalent; and eyes in which the ocular fundus could not be observed because of media opacities.

All eyes underwent a thorough ophthalmic evaluation, including slit-lamp biomicroscopy, fundus examination, and axial length measurement (Sonomed, A/B Scan 500, Lake Success, NY, USA). OCT (Cirrus, Carl Zeiss Meditec, Inc., Dublin, CA, USA) measurements were performed at the same time (in the morning between 9 am and 11 am) to avoid the diurnal variation of the choroidal thickness measurement. We used the HD 5 line raster scan with the EDI mode to evaluate the choroid. The protocol consisted of 6-mm parallel lines with 1024 A-scans/B-scans, averaging 4 B-scans per image. Choroidal thickness was measured by two independent observers who were blind to each other's results. The correlation of the choroidal thickness values obtained from the two observers was evaluated.

The subfoveal choroidal thickness was determined manually from the outer edge of the hyperreflective RPE to the inner sclera centered on the fovea by the observer (Figure 1A). The choroidal thickness was measured at 500 µm intervals, up to 1000 µm temporal and nasal to the foveola, from a total of 5 points so measurements were taken from a total of 5 points. The central measurement was considered subfoveal, consecutive measurements were used for the foveal and parafoveal choroidal thicknesses (Figure 1B). Corresponding nasal and temporal measurements were averaged for each eye. The eye with the best visualization of the border between the choroid and sclera (i.e., the choroidal- scleral interface was used in patients with AMD patients and in controls.

The IOP and OPA readings were acquired using Pascal DCT (Swiss Microtechnology AG, Port, Switzerland), which is a slit-lamp-mounted contact tonometer that can monitor IOP and OPA simultaneously. After instillation of proparacaine eye drops, the probe was left on the cornea for 8 to 10 s. Measurement with quality scores less than 3 were preferred (scale 1 to 5); therefore, measurements were repeated until scores of 1an IOP reading with a quality score between 1-3 were obtained.

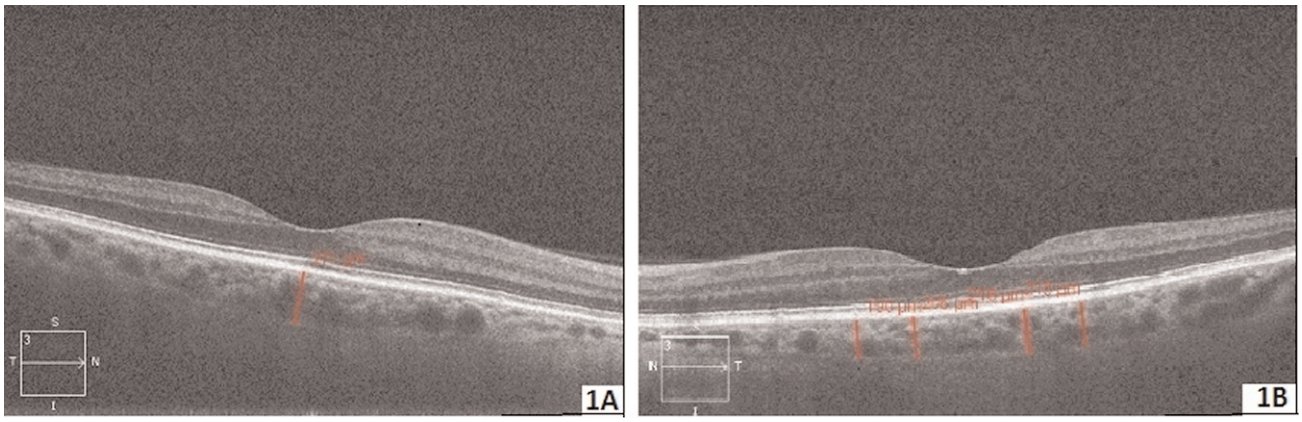


Figure 1— Choroidal images were obtained by spectral-domain optical coherence tomography using enhanced depth imaging mode. **1A.** Subfoveal choroidal thickness; **1B.** Foveal and parafoveal choroidal thicknesses.

Statistical Analysis

All statistical analyses were performed using Statistical Package for Social Sciences (version 17.0, SPSS Inc., Chicago, IL, USA). The Kolmogorov-Smirnov test was used to determine the normality of the distributions for all variable groups. Parametric Student-*t* tests were used to compare variables with normal distributions. Pearson's correlation analyses were used coefficient test was applied to determine the relationship between the findings. For all tests, a p-value of <0.05 was considered significant.

Results

Forty-four cases of non-exudative AMD were included in this study from 44 patients who fulfilled the inclusion criteria, These were compared against a normal control group of 41 eyes from 41 control subjects. Table 1 reports all descriptive and statistical information for the AMD and control groups. There were no statistically significant differences in age, sex distribution, IOP, OPA, and axial length values between the groups.

The mean choroidal thicknesses for the subfoveal, foveal, and parafoveal locations in the AMD group were 245.82±24.29, 230.66±23.44, and 219.55±25.39 µm, respectively. The corresponding values in control group were 278.44±34.18, 263.76±32.45, and 253.79±34.81 µm, respectively. The average choroidal thickness was significantly lower in patients with AMD than that in control subjects for all the three regions ($p<0.001$) (Table 2). In addition, there was a strong correlation for the choroidal thickness measurements between observers at each locations ($p<0.001$).

When all participants were assessed together, there was a weak correlation between OPA and IOP, but this was not statistically significant ($p=0.066$; $r=0.202$). However, when the

Table 1— Patient Characteristics.

Parameters	AMD Group	Control Group	p
Patients, n (%)	44 (51.8%)	41 (48.2%)	
Age (±SD) (years)	69.6(±8.97)	65.0 (±5.89)	0.630
Sex (eyes) M/F	16/28	17/24	0.125
IOP (±SD) (mmHg)	17.04 (±2.33)	17.43 (±2.95)	0.497
OPA (±SD) (mmHg)	3.43 (±1.14)	3.49 (±1.12)	0.816
AL (±SD) (mm)	24.45 (±2.67	24.62 (±2.42)	0.567

AL, Axial length; AMD, Age-related macular degeneration; F, female; IOP intraocular pressure; M, male; OPA, ocular pulse amplitude; SD, standard deviation.

Table 2— Mean Choroidal Thicknesses in the Eyes of Control Individuals and Patients with Age-related Macular Degeneration.

Choroidal Thickness (µm)	AMD Group	Control Group	p
Subfoveal (±SD)	245.82 (±24.29)	278.44 (±34.18)	<0.001
Foveal (±SD)	230.66 (±23.44)	263.76 (±32.45)	<0.001
Parafoveal (±SD)	219.55 (±25.39)	253.79 (±34.81)	<0.001

AMD, Age-related macular degeneration; SD, standard deviation

groups were considered separately, there was a statistically significant positive correlation in the control group (p=0.041; r=0.313).

The choroidal thickness was not correlated with age at either the subfoveal, foveal, or parafoveal locations. The respective p values were 0.358, 0.699, and 0.840 in the compared and 0.788, 0.568 in the control group. Additionally, there was no significant correlation between age and OPA, in either group (AMD group, p=0.352; control group, p=0.524). In both groups, the mean choroidal thickness was greatest in the subfoveal region, and decreased gradually increasing distance from the fovea.

There was a moderate positive correlation between choroidal thickness and OPA at all three studied regions, in controls. However, only the foveal area showed a significant positive correlation in the eyes of AMD patients (Table 3).

Discussion

The choroidal vascularity has a prominent in maintaining normal retinal morphology and function. Abnormal choroidal blood volume and decreased flow can result in photoreceptor dysfunction and death (10). A possible sign of decreased choroidal blood perfusion could be thinning of the choroid. Until recently, information about the choroidal thickness could be acquired only by histologic examination, which is unlikely to reflect the true thickness of the living choroid, because of changes in the prominence of blood vessels. The development of methods to measure choroidal thickness *in vivo* has facilitated new research into both normal and pathological processes in the choroid. Techniques such as partial coherence interferometry and SD-OCT now permit detailed measurements of the living choroid (5).

The OPA is thought to provide information about intraocular blood flow by recording the difference between the systolic and diastolic IOP, and could be used as an indirect measure of choroidal perfusion (8). Pulsatile ocular blood flow primarily measures the pulsatile component of choroidal perfusion, independently of the retinal or retrobulbar circulation. Zion et al. found that the pulsatile index of the choroid, as measured by color Doppler imaging was strongly associated with OPA (11).

In our patients with AMD, both drusens and RPE abdormalities were present, but we excluded eyes with advanced geographic atrophy to standardize the group. Because AMD is characterized by changes in both RPE and Bruch's membrane, and because these layers are nourished by the choroid blood vessels, it is possible that choroidal vascular insufficiency is associated with AMD (12). Furthermore, some individuals lose their visual acuity earlier than others that have the

Table 3— Correlation Between Ocular Pulse Amplitude and Mean Choroidal Thickness.

		Subfoveal Choroidal Thickness	Foveal Choroidal Thickness	Parafoveal Choroidal Thickness
OPA in AMD Group	r	0.264	0.305	0.120
	p	0.087	0.047	0.445
OPA in Control Group	r	0.462	0.401	0.459
	p	0.002	0.009	0.003

AMD, Age-related macular degeneration; CT, choroidal thickness; OPA, ocular pulse amplitude; p, statistically significant level p value; r, Pearson correlation coefficient.



same fundal lesions. Therefore, it is reasonable to assume that oxidative stress, genetic abnormalities, and environmental conditions and not only photoreceptor dysfunction and the presence of drusen are relevant in the development of non-exudative AMD (13).

In our control group, the choroidal thickness was 278.44±34.18 µm in the subfoveal area. The variation in choroidal thickness values reported in previous studies may be result of different subject ages, OCT instruments, and different measurement methods.

In contrast, the choroidal thickness was 245.82±24.29 µm in the subfoveal area in the AMD group, and the choroidal thicknesses in the subfoveal, foveal, and parafoveal areas were significantly lower in the AMD group than those in the control group. Similarly, Kim et al. examined 37 eyes with from non-exudative AMD patients, 24 eyes with neovascular AMD, and 29 control eyes and reported mean subfoveal choroidal thicknesses of 186.62±64.02, 226.46±102.87, and 241.97±66.37 µm, respectively (14). Although they used a different OCT instrument (3-dimensional [3D] OCT-1000; Topcon Corp., Tokyo,Japan); therefore, produced different values to ours, the similar pattern suggests that the mean choroidal thickness is significantly reduced in non-exudative AMD.

In both groups, the mean choroidal thickness was greatest in the subfoveal region, and gradually decreased with increasing distance from the fovea. This pattern is consistent with previous studies of the choroidal thickness in normal eyes (15,16). Manjunath et al. found that the choroid was thinnest nasally, and thickest in the subfoveal region, but it thinned again temporally; however none was as thin as the choroid proximal to the disc (17). Our results were broadly similar for the healthy subjects. In addition, we observed that this pattern of the thickness was preserved in patients with AMD, even though the choroidal thickness was significantly thinner in the AMD than that in the control group. Parafoveal choroidal regions were also affected by AMD in our study.

Although, Maul et al. found that increasing age is associated with a thinner choroid, and that reduced choroidal thickness is probably associated with particular phenotypes in the aging eye (18), we found no statistically significant correlation between age and the choroidal thickness in either group. Since our study groups included patients, with presbyopia and AMD, the narrow age range, made it unlikely that we would find a difference between age and the choroidal thickness. However, because our study groups were age matched, our comparisons were probably not influenced by age-related changes in the choroidal thickness. Therefore, reduced choroidal thickness may play an indirect role as a modulator of natural progression in AMD, or could even be cause of AMD.

It has been hypothesized that blood hypoperfusion could result from abnormal choroidal thickness, with OPA being useful as an indirect indicator of the choroidal blood supply. In our study, we found a significant positive relationship between the OPA and the choroidal thickness in subfoveal, foveal, and parafoveal locations, in the control group, but only a weak positive relationship in the fovea of patients with AMD. The lack of a significant positive relationship when comparing the AMD and control groups may be attributed to the impaired choroidal pattern in AMD group. Dervisogullari et al. found significantly decreased choroidal thicknesses with normal OPA measurements when patients with unilateral migraines had acute attacks (19), but failed to assess the correlation between these findings. Since the vascular components have a major role in migraine, one can hypothesize that the choroidal thickness is more sensitive to vascular changes.

In our study, while there was a significant difference for the choroidal thickness between the two groups, there was no difference between the groups in terms of the OPA. So, it may be hypothesized that the choroidal thickness is affected earlier than the OPA in patients with AMD, which might therefore contribute to the pathophysiology of the disease. Given that the OPA is a gross value that reflects the entire whole choroidal circulation, while AMD is a relatively localized disease, this result may indicate that the OPA does not affect the pathophysiology of AMD.

A limitation of the current study was that the Cirrus OCT did not automatically measure the choroid, even though there was a strong correlation between the two blinded observers. Other shortcomings are the relatively limited number of patients, and the absence of a longitudinal follow-up to assess possible long-term changes in the choroidal thickness and OPA.

In conclusion, we found a considerable correlation between the OPA and choroidal thickness in healthy and relatively elderly individuals, but this correlation was not preserved in patients with AMD. Although, the relationship between the OPA and choroidal thickness is not proven exactly in this study, these are the earliest results on this topic due to the lack of similar studies in the literature. Larger studies with younger patients could further clarify this relationship.

Acknowledgments

The authors declare no conflicts of interest.

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RESEARCH

ASSESSMENT OF THE ACTIVITIES OF DAILY LIVING OF THE ELDERLY IN REFERENCE TO THE THUNDER BAY INDEX

ABSTRACT

Introduction: A total of 175 elderly individual residing in Ovacık within the province of Kırıkkale participated in this study, which aimed to determine the changing needs of the elderly by means of the Thunder Bay Index and assess their daily living activities using the Thunder Bay Index.

Materials and Method: In the study, the Thunder Bay Index and the Katz Index of Independence in Activities of Daily Living served as data collection tools. Methods used for the analysis of the data were percentage, standard deviation, arithmetic mean, T test, and variance analysis.

Results: When the Thunder Bay Index statistics are evaluated individually, the most positive answer was given to the item: "I can accept my past" ($\bar{x}$ =3.81). The most negative answer was given for the following item: "I can procure some money from state funds when I need to" ($\bar{x}$ =2.58). When the group averages are considered, elderly individuals who have a lower level of education, have less income, have four or more children, do not own their house, gave more negative opinions regarding their needs. The results demonstrate that elderly individuals who could independently take a bath, change clothes, sit, stand, use the toilet, walk, and shop gave more positive opinions than those who were partially or completely dependent.

Conclusion: It is not possible to prevent aging; however, it is possible to offer elderly individual minimum dependence and a better quality of life by satisfying their needs.

Key Words: Elderly; Daily Living Activities; Thunder Bay Index.

ARAŞTIRMA

YAŞLILARIN GÜNLÜK YAŞAM AKTİVETELERİNİN THUNDER BAY ÖLÇEĞİ'NE GÖRE DEĞERLENDİRİLMESİ

ÖZ

Giriş: Yaşlıların Thunder Bay ölçeği ile değişen ihtiyaçlarını belirleyerek, günlük yaşam aktivitelerinin Thunder Bay Ölçeği'ne göre değerlendirilmesini amaçlayan bu çalışmaya Kırıkkale ili, Ovacık mahallesinde ikamet eden 175 yaşlı katılmıştır.

Gereç ve Yöntem: Çalışmada veri toplama aracı olarak "Thunder Bay Ölçeği" ve "Katz Günlük Yaşam Aktiviteleri Ölçeği" kullanılmıştır. Verilerin çözümlenmesinde frekans, yüzde, standart sapma, aritmetik ortalama, t testi ve varyans analizi kullanılmıştır.

Bulgular: Thunder Bay Ölçeğindeki maddelere ilişkin istatistikler incelendiğinde, en olumlu madde "Geçmişimi kabul edebilirim" ($\bar{x}$ =3,81), diğer maddelere göre daha olumsuz madde ise "İhtiyacım olduğunda devlet kaynaklarından para temin edebilirim" ($\bar{x}$ =2,58) maddesidir. Grup ortalamaları incelendiğinde, eğitim düzeyi düşük olanların, aylık gelir düzeyi düşük olanların, 4 ve üzerinde çocuğa sahip olanların, kiracıların diğer gruplara göre ihtiyaçları konusunda daha olumsuz görüş belirttikleri tespit edilmiştir. Banyo, giyinme, oturma/kalkma, tuvalet, yürüme ve alışveriş esnasında bağımsız olduğunu belirten yaşlıların bağımlı ve yarı bağımlı olduğunu belirten yaşlılara göre daha olumlu görüş belirttikleri saptanmıştır

Sonuç: Yaşlılık kaçınılmazdır ancak bireyin bağımlılık gereksiniminin en az düzeyde tutulabileceği, ihtiyaçlarının giderilerek yaşam kalitesinin sürdürülebileceği bir yaşlılık mümkündür.

Anahtar Sözcükler: Yaşlı; Günlük Yaşam Aktivitesi; Thunder Bay Ölçeği.

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INTRODUCTION

Elderliness is a developmental stage in one's life associated with the advancement of chronological age accompanied by biological, psychological, and sociological aspects that has the highest rates of requirement for care and medical attention (1). The possibility of encountering physical problems increases with elderliness. Additionally, an individual's loss of social and economic power increases the risk of psychological problems (2). In this context, the elderly are required to satisfy their fundamental needs, perform their daily activities, have enough income, become self-sufficient, and live in a safe environment (3).

As an individual's age increases, their daily living activities decrease; in later years, certain health problems arise. Physical activity slows down some age-related deterioration in the body. Therefore, the biological and psychological losses caused by elderliness create social losses (4,5). During the elderliness period, changes such as retirement, transformation from an extended to a nuclear family, loss of loved ones, physical and cognitive deterioration, and increased dependence on others to accomplish daily activities lead to an increase in an individual's needs and place him/her into a psychologically incompatible medium. A study conducted by the American Geriatric Society found that 40% of individual between the ages of 65 and 75 reported inadequate daily living activities (6).

A successful aging process depends not only on the individual's characteristics but also on the psycho-social, financial, and physiological support services that society provides. The elderly's contribution toward their families, societies, and economies should be accepted and supported, their access to social environments should be facilitated, their needs should be determined, and their rights should be respected (7).

While studies examining the daily activities of the elderly have been conducted in Turkey (1,5,8-10), only one used the Thunder Bay Index; it focused on its validity and reliability (3). Therefore, the present study was conducted to assess the changing needs of the elderly by means of the Thunder Bay Index and to determine their daily living activities with respect to the Thunder Bay Index.

MATERIALS AND METHOD

Participants

The study involved participants aged 65 years or older in the Ovacık quarter of the province of Kırıkkale. Due to time and cost restrictions, a group of 175 individuals was designated for sampling using a systematic sampling method, which is a type of probability sampling. The study protocol was approved by the university research ethics committee and informed consent was obtained from all individuals who agreed to participate the study.

A maximum of 1300 elderly people were identified residing at the study site, and thus, sample size was calculated using the formula that is recommended for quantitative studies and finite population (11). In this formula, population size (N) was 1300, standard deviation calculated with the first 30 questionnaires was σ=0,7; effect size was d=0.10; theoretical value corresponding to σ=0.05 significance level was $z_{0.05}$=1.96; and minimum sample size calculated with this formula was 165 people. Considering missing and not returning questionnaires, a total of 180 questionnaires were distributed and 175 questionnaires were evaluated.

Data Collection

In the study, the Thunder Bay Index questionnaire was used as the data collection method. The School of Social Work at Lakehead University developed the Thunder Bay Index; Yıldırım et al. evaluated its validity and reliability in Turkish (3). This index is comprised of 38 items and divided into five headings, which are identified according to Maslow's hierarchy of needs: Physiological, Safety, Love/Belonging, Esteem, and Self-Actualization. Cronbach's alpha coefficients regarding the needs of the elderly are calculated as follows: 0.71 for Physiological, 0.81 for Safety, 0.82 for Love/Belonging, 0.76 for Esteem, and 0.77 for Self-Actualization.

The "Katz Index of Independence in Activities of Daily Living" (ADL) was also used in this study. The ADL index comprises eight questions regarding daily activities, including taking a bath, changing clothes, using the toilet, moving, sitting and standing, walking, cooking, cleaning and shopping (12).

Data Analysis

The SPSS for Windows software program was used as a data analysis tool, and descriptive statistics (frequency, percentage, arithmetic mean, standard deviation) are primarily used. When comparing the opinions of the elderly about the Thunder Bay Index with regard to groups, a T-test was used if there were two groups and variance analysis was used if there were more than two groups. Lastly, the Cronbach's alpha coefficient regarding the reliability of the index was calculated as 0.897.



RESULTS

The distribution of the elderly who participated in this study with respect to certain characteristics is presented in Table 1. According to this distribution, a little over half (56.6%) of the 175 participants are women. Some of the largest percentage groups observed in the table are elderly individuals between the ages of 71 and 75 (33.2%) who are primary school graduates (38.9%), have an income between 892 and 1500 Turkish Liras (TL) (44.6%), have three children (29.7%), live with their spouses (40.6%), own their houses (76.6%), and have *"Emekli Sandığı"* (state retirement and social security fund for civil servants) as their social security (39.4%).

According to Table 2, the quaternary scale, which assesses the physiological needs of the elderly and their need for safety, respect, love, and self-actualization, reached an average value of $\bar{x}$ =3.32. When the statistics are evaluated individually,

Table 1— Distribution of the Participants with Respect to Their Characteristics

Variable	Group	Number (n)	Percentage (%)
Gender	Female	99	56.6
	Male	76	43.4
Age	65–70	43	24.6
	71–75	58	33.2
	76–80	41	23.4
	81–85	23	13.1
	85 or older	10	5.7
Education Status (Last graduated level)	Primary School	68	38.9
	Secondary School	55	31.4
	High School	27	15.4
	Higher Education	25	14.3
Monthly Income	891 TL or less (Minimum Wage)	34	19.4
	892–1500 TL	78	44.6
	1501–2250 TL	29	16.6
	2251–3000 TL	19	10.9
	3001 TL or more	15	8.5
Number of Children	None	4	2.3
	One	18	10.3
	Two	36	20.6
	Three	52	29.7
	Four	33	18.8
	Five or more	32	18.3
Living ...	Alone	33	18.8
	With Spouse	71	40.6
	With Spouse and Children	28	16.0
	With Children	43	24.6
House Property	House Owner	134	76.6
	Tenant	41	23.4
Social Security	Yeşil Kart (Health card for uninsured citizens)	12	6.9
	Emekli Sandığı (State Retirement and Social Security fund for civil servants)	69	39.4
	Bağkur (Social Security and Pension system for artisans, craftsmen and the self-employed)	35	20.0
	SSK (Social Security Institution for private sector employees)	59	33.7
Total		175	100.0

Table 2— Descriptive Statistics Regarding the Thunder Bay Index.

Items / Questions	1 %	2 %	3 %	4 %	$\bar{x}$	sd
I can accept my past (e)	0.6	0.6	16.6	82.3	3.81	0.45
I try to make the best of my current condition (sa)	1.1	2.3	17.1	79.4	3.75	0.55
I trust my judgment (sa)	-	4.6	20.0	75.4	3.71	0.55
I feel that I am loved by my kith and kin (l)	1.7	2.3	22.3	73.7	3.68	0.61
My room is adequately heated (p)	1.7	7.4	14.3	76.6	3.66	0.69
I can rest when I want to (p)	4.0	4.0	17.1	74.9	3.63	0.75
I can get support from someone in times of emergency (s)	3.4	5.7	16.6	74.3	3.62	0.75
I am not afraid of being myself (e)	0.6	8.0	22.3	69.1	3.60	0.66
I can decide what is right or wrong for me (sa)	2.3	4.0	25.1	68.6	3.60	0.68
The bathroom in my room is adequate for my hygiene need (p)	5.7	3.4	18.3	72.6	3.58	0.81
I have enough clothes (p)	4.0	4.6	24.0	67.4	3.55	0.76
I feel fine/comfortable even if I cannot do a job perfectly (e)	4.6	8.0	22.9	64.6	3.47	0.83
I always find someone when I want to chat (l)	5.1	9.7	20.0	65.1	3.45	0.87
I feel free to be myself and I accept the consequences (sa)	6.3	5.1	26.9	61.7	3.44	0.85
I have close friends (l)	9.1	4.6	20.6	65.7	3.43	0.94
I feel safe in my relations with others (e)	2.3	7.4	35.4	54.9	3.43	0.73
I think I can manage myself (sa)	4.0	6.9	31.4	57.7	3.43	0.79
I take care of my own well-being (e)	6.3	6.3	29.1	58.3	3.39	0.86
I love the way I live my life (e)	6.3	9.7	24.0	60.0	3.38	0.90
I am content with the satisfaction of my health needs (s)	5.7	10.3	24.6	59.4	3.38	0.89
I feel important / I feel that I matter (l)	4.6	9.7	29.7	56.0	3.37	0.84
I trust my own skills to overcome an issue (e)	5.1	7.4	38.9	48.6	3.31	0.82
I enjoy life (l)	6.9	8.0	35.4	49.7	3.28	0.88
I feel powerful (sa)	8.0	9.1	33.1	49.7	3.25	0.92
I have an appropriate diet (p)	8.0	8.6	36.6	46.9	3.22	0.91
I can do things I want to do (e)	9.1	10.3	29.7	50.9	3.22	0.97
I believe that individuals are genuinely honest and reliable (sa)	4.6	17.7	34.3	43.4	3.17	0.88
I can deal with the ups and downs of the life (e)	8.0	13.7	33.7	44.6	3.15	0.94
I can pass the time with individual even though I do not approve everything about them (sa)	8.6	12.6	34.9	44.0	3.14	0.95
It is easy to provide suitable living conditions for an elderly person (p)	8.6	15.4	36.6	39.4	3.07	0.94
Some exercises are part of my daily routine (p)	17.1	7.4	26.9	48.6	3.07	1.12
Other individuals do not have to agree with my view (e)	15.4	17.7	17.1	49.7	3.01	1.14
I can wander/travel when I need to (s)	13.1	21.7	22.9	42.3	2.94	1.08
I have a good time with my friends (l)	21.1	13.7	24.0	41.1	2.85	1.17
I can cope with daily life as I did in the past (s)	20.6	17.7	22.3	39.4	2.81	1.17
I have enough savings for rainy days (s)	28.6	11.4	17.1	42.9	2.74	1.28
I feel safe when I am alone (s)	25.7	11.4	29.7	33.1	2.70	1.18
I can procure some money from state funds when I need to (s)	34.9	9.7	18.3	37.1	2.58	1.30

(p) Physiological, (s) Safety, (l) Love/Belonging, (e) Esteem, (sa) Self-Actualization,
1: I agree–4: I disagree.

the most positive answers were given to the following items: "I can accept my past" ($\bar{x}$ =3.81); "I try to make the best of my current condition" ($\bar{x}$ =3.75); and "I trust my judgment" ($\bar{x}$ =3.71). The most negative answers were given for the following items: "I can procure some money from state funds when I need to" ($\bar{x}$ =2.58); "I feel safe when I am alone" ($\bar{x}$ =2.74); and "I have enough savings for rainy days" ($\bar{x}$ =2.70).

Concerning the opinions of the elderly regarding their physiological needs and their need for safety, love and belonging, esteem, and self-actualization differ considerably



(p>0.05) with respect to factors such as gender, age, and individuals they live with, their opinions also differ considerably (p<0.05) with respect to factors such as education, monthly income, number of children, house property, and social security (Table 3). When the group averages are considered, elderly individuals who have a lower level of education, have less income, have four or more children, do not own their house, and use a *Yeşil Kart* (Green Card, which is a health card for uninsured citizens) gave more negative opinions regarding the above-mentioned needs.

The table 4 shows that, while the participants' opinions regarding the Thunder Bay Index do not differ considerably with respect to their dependence status for cooking and cleaning (p>0.05), they differ considerably with respect to their dependence status for taking a bath, changing clothes, sitting, standing, using the toilet, walking, and shopping (p<0.05).

Table 3— Comparison of Elderly Individuals' Opinions Regarding the Thunder Bay Index with Respect to Certain Characteristics.

Variable	Group	$\bar{x}$	sd	t	P
Gender	Female	3.35	0.51	1.017	0.310
	Male	3.28	0.42		
Age	65–70	3.37	0.44	2.311	0.060
	71–75	3.37	0.50		
	76–80	3.26	0.49		
	81–85	3.34	0.39		
	85 or older	2.92	0.44		
Education Status (Last graduated level)	Primary School	3.11	0.46	16.256	0.000*
	Secondary School	3.27	0.43		
	High School	3.55	0.33		
	Higher Education	3.73	0.40		
Monthly Income (TL)	891 or less (Minimum Wage)	2.91	0.48	15.720	0.000*
	892–1500	3.31	0.41		
	1501–2250	3.41	0.43		
	2251–3000	3.51	0.34		
	3001 or more	3.83	0.26		
Number of Children	None	3.34	0.45	7.306	0.000*
	One	3.73	0.27		
	Two	3.49	0.45		
	Three	3.31	0.45		
	Four	3.14	0.48		
	Five or more	3.08	0.44		
Living ...	Alone	3.32	0.56	0.033	0.992
	With Spouse	3.31	0.45		
	With Spouse and Children	3.30	0.47		
	With Children	3.33	0.46		
House Property	House Owner	3.41	0.44	5.008	0.000*
	Tenant	3.01	0.47		
Social Security	Health card for uninsured citizens (Yeşil Kart)	2.83	0.44	11.135	0.000*
	State Retirement and Social Security fund for civil servants (Emekli Sandığı)	3.51	0.45		
	Social Security and Pension system for artisans, craftsmen and the self-employed (Bağkur)	3.15	0.42		
	Social Security Institution for private sector employees (SSK)	3.29	0.43		

*p<0.001

Table 4— Comparison of the Opinions of the Elderly Regarding the Thunder Bay Index with Respect to Their Daily Living Activities.

Variable	Group	$\bar{x}$	sd	t	P
Taking a bath	Dependent	3.06	0.54	4.365	0.014*
	Partially Dependent	3.23	0.44		
	Independent	3.37	0.46		
Changing clothes	Dependent	2.93	0.53	7.447	0.001*
	Partially Dependent	3.09	0.44		
	Independent	3.38	0.46		
Sitting down / Standing up	Dependent	3.07	0.49	4.085	0.018*
	Partially Dependent	3.09	0.49		
	Independent	3.36	0.46		
Using the toilet	Dependent	3.04	0.47	6.726	0.002*
	Partially Dependent	2.99	0.46		
	Independent	3.37	0.46		
Walking	Dependent	2.97	0.49	4.003	0.020*
	Partially Dependent	3.17	0.53		
	Independent	3.36	0.45		
Cooking	Dependent	3.25	0.46	0.569	0.567
	Partially Dependent	3.32	0.48		
	Independent	3.35	0.48		
Cleaning	Dependent	3.23	0.52	1.315	0.271
	Partially Dependent	3.37	0.43		
	Independent	3.31	0.50		
Shopping	Dependent	3.28	0.49	5.975	0.003*
	Partially Dependent	3.22	0.49		
	Independent	3.51	0.39		

*p<0.001

The results demonstrate that elderly individuals who could independently take a bath, change clothes, sit, stand, use the toilet, walk, and shop gave more positive opinions than those who were partially or completely dependent.

Discussion

Analysis of the scientific statistics related to the opinions of the elderly who participated regarding the items included in the Thunder Bay Index showed that the average value was $\bar{x}$ =3.32 on a quaternary scale assessing the general needs of the elderly, such as physiological, safety, love and belonging, esteem, and self-actualization. This value may be considered a positive outcome on a quaternary scale. The items with the most positive answers were "I can accept my past" ($\bar{x}$ =3.81), and "I try to make the best of my current condition" ($\bar{x}$ =3.75). The most negative answers were given to the items "I can procure some money from state funds when I need" ($\bar{x}$ =2.58), and "I feel safe when I am alone" ($\bar{x}$ =2.74). This finding suggests that the elderly can satisfy their needs regarding "self-actualization" and "esteem" more efficiently than those for "safety" and that the latter is what the elderly primarily need. Additionally, because this study was conducted using the Thunder Bay Index, limited data were available for making comparisons and creating arguments.

According to the results of the T-test and variance analysis, which were conducted to compare the participants' opinions regarding the Thunder Bay Index with respect to certain characteristics, the general opinions of the elderly regarding their physiological needs and their needs for safety, love and belonging, esteem, and self-actualization do not differ considerably with respect to gender, age, and the individual they live with (p>0.05). However, they differ considerably with respect to their level of education, monthly income, number of children, house property, and type of social security (p<0.05). When the group averages are considered, elderly individual who have a lower level of education, have less inco-



me, have four or more children, do not own their house, and use a *Yeşil Kart* gave more negative opinions about the above-mentioned needs. This may be because these groups face difficulties while satisfying their fundamental needs. As individuals get older, their medical costs and the costs of their care increase. If an elderly person has social security and his or her level of income is enough to sustain a healthy, comfortable way of living, his or her level of satisfaction regarding his or her needs is likely to increase (3).

The study showed that the elderly are usually independent while taking a bath, changing clothes, sitting down, standing up, using the toilet, walking, and cooking; they are partially dependent on others for house cleaning. Ünsaldı and Piyal found that elderly individual suffering from chronic diseases completely depend on others for heavy housework, doing the laundry, ironing, shopping, and cooking (13). İnanır et al.'s study indicated that elderly patients are partially dependent on others for activities such as cleaning, shopping, transportation, cooking, taking a bath, using the telephone, taking medicines, doing the laundry, managing their budget, and self-care (14). However, they are independent during activities such as changing clothes, using the toilet, transferring, and feeding; they study found that they are not fully dependent on others for anything.

It becomes clear that the opinions of the elderly regarding the Thunder Bay Index do not differ considerably with respect to their dependence status during cooking and cleaning ($p>0.05$). Their opinions differ considerably with respect to their dependence status during activities such as taking a bath, changing clothes, sitting down, standing up, using the toilet, walking, and shopping ($p<0.05$). The results show that the elderly individual who reported as independent during activities such as taking a bath, changing clothes, sitting down, standing up, using the toilet, walking, and shopping gave more positive opinions than those who reported as partially or completely dependent. This may be a result of the fact that when elderly individual are less dependent, they are more capable of satisfying their physiological needs and their needs for safety, love and belonging, esteem, and self-actualization.

Considering the findings of the study three recommendations have been presented. Based on the Thunder Bay Index items for which the elderly gave the most negative opinions, their "safety" needs should be addressed primarily by taking necessary steps and their level of income should be upgraded. Care and support required for elderly individual to maintain their daily living activities and their quality of life should be provided. Nationwide studies on larger samplings should be performed to examine the needs of the elderly and their daily living activities.

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RESEARCH

VALIDATION OF THE TURKISH VERSION OF THE RETIREMENT SATISFACTION INVENTORY

ABSTRACT

Introduction: Retirement is an important milestone that indicates one's transition into the later period of life which causes one's social status to change affecting all domains of life. This study aims to provide psychometric data for Turkish adaptation of scale of Retirement Satisfaction Inventory.

Materials and Method: Retirement Satisfaction Inventory measures motivation for retirement, satis-faction with life in retirement and leisure activities. The Retirement Satisfaction Inventory scale was applied to 444 Turkish pensioners with mean age of 54.12±5.67 years. Confirmatory factorial analysis and exploratory factor analysis were performed using AMOS 22 module the SPSS package respec-tively.

Results: The adaptation of the RSI to Turkish indicated a three scale structure: the reasons for retire-ment, satisfaction with life in retirement, and leisure activities. These scales showed a structure with four, two and three main factors, respectively, which is slightly different from those reported in the original instrument. The confirmatory factorial analysis demonstrated the adequate fit of the model for the three scales.

Conclusion: Overall, the Retirement Satisfaction Inventory Turkish RSI-T appears to be a leading valid and reliable instrument for determining the level of retirement satisfaction, reasons for retirement, and sources of retirement satisfaction in Turkish culture. However, it could be suggested that RSI should be assessed in other non-Western cultures as well.

Key Words: Satisfaction With Life in Retirement; Reasons for Retirement; Leisure Activities; Sources of Enjoyment; Validity.

ARAŞTIRMA

EMEKLİLİK DOYUM ENVANTERİNİN TÜRKÇE FORMUNUN GEÇERLİK VE GÜVENİRLİK ÇALIŞMASI

ÖZ

Giriş: Emeklilik bireyin bütün yaşamını etkileyen, statüsün değişmesine yol açan ve bireyin yaşamının son dönemine girdiğini gösteren önemli bir dönüm noktasıdır. Bu çalışma Emeklilik Doyum Envanterini Türkçeye uyarlamayı ve psikometrik özelliklerini incelemeyi amaçlamaktadır.

Gereç ve Yöntem: Emeklilik Doyum Envanterini emeklilik öncesi geçiş dönemini, emekli olma nedenini, emeklilik doyumunu, emekliliğe uyum ve değişimi, emeklilik dönemindeki boş zaman faaliyetlerini, emeklilik doyum kaynaklarını ve genel yaşam doyum düzeyini ölçmektedir. Emeklilik Doyum Envanteri yaş ortalaması 54,12±5,67 olan 444 Türk emekliye uygulanmıştır. Betimleyici analizler SPSS 22 paket program kullanılarak ve doğrulayıcı ve açımlayıcı faktör analizi AMOS 20 paket programı kullanılarak yapılmıştır.

Bulgular: Emeklilik doyum envanterinin Türkçeye uyarlaması sonucu üç alt ölçek ortaya çıkmıştır: emekli olma neden, emeklikte yaşam doyumu ve boş zaman faaliyetleri. Bu alt ölçek sırasıyla dörtlü, ikili ve üçlü alt boyutlara ayrılmıştır. Bu açıdan orijinal ölçme aracından farklılık göstermektedir. Yapılan doğrulayıcı faktör analizi üç alt ölçekten oluşan emeklilik doyum envanterinin yeterli uyum indeksine sahip olduğunu göstermiştir.

Sonuç: Emeklilik Doyum Envanterinin Türkçe formu bireylerin emeklilik doyumu düzeyini, emekli olma nedenini ve emekli dönemindeki sosyal kaynakları ortaya koymak içi geçerli ve güvenilir bir ölçme aracıdır. Bununla birlikte, farklı gruplara da ve diğer kültürlerde de uyarlama çalışması yapılması önem arz etmektedir.

Anahtar Sözcükler: Emeklik Doyumu; Emekli Olma Nedeni; Sosyal Kaynaklar; Geçerlik; Güvenirlik.

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INTRODUCTION

The RSI was developed by Floyd et al. (1) in order to assess both current retirement satisfaction and perceptions of retirement related experiences predicting adjustment and well being in later life. Original Inventory had three scales: Reasons for retirement, Satisfaction with life in retirement, Sources of enjoyment and group of items measuring transition of pre and post retirement, other reasons for retirement, social activity and overall. Floyd et al. (1) stated that the inventory had acceptable test-retest reliability. Satisfaction correlated with concurrent measures including pre and postretirement experiences, and discriminated voluntary and involuntary retirements. However, few studies have also been published in European countries such as France (2), Spain (3), and Italy (4). These studies' results demonstrate that the RSI is a valid and reliable instrument for assessing retirement satisfaction in America and Europe.

However, the previous studies lacked cross-validation in different samples. As results of exploratory and confirmatory factor analysis might differ, cross-validation of an instrument in different samples is important. Although the RSI has been used in western individualist cultures like America, France, Italy and Spain, the psychometric properties of RSI in a collectivist culture sample have not been studied yet. Additionally, to date there is no evidence exists concerning development and adaptation of any other retirement satisfaction scales within the Turkish sample, a collectivist culture. Finally, developing culturally appropriate instruments meeting the needs of a population is a prerequisite of understanding retirement period for further researches and intervention. Therefore, the present study will contribute to retirement-related research and applications in Turkey and other countries with similar cultural patterns. The purposes of the current study were: (a) to explore the factor structure of the RSI in sample Turkish retirees, (b) to cross-validate the structure of the model and assess the psychometric properties of the RSI with an independent sample of Turkish retirees.

MATERIALS AND METHOD

Subjects

Two independent samples of retirees from different cities in Turkey with a mean age of 54 were used. Sample 1 served as the calibration sample for the first objective study to explore the appropriate RSI structure. This sample consisted of 234 retired subjects (55% women, and 45% men). Their ages ranged from 40 to 75, with a mean age of 54.67 (sd=5.67). Sample 2 served as the validation sample and consisted of 210 retirees (51.4 % women and 48.6% men). Their ages ranged from 41 to 79, with a mean age of 53.55 (sd=5.62).

Ethics Statement

Consent was taken from retirees who participated in the study and it conformed to the provisions of the Declaration of Helsinki. All participants were informed about the purpose of the study and ensured that their answers were used anonymously for research purposes only. The researcher has taken into consideration the laws and regulations of the Turkey. The researcher provided monitoring information to the school management.

Procedure

The inventory was translated by two researchers who were native Turkish speakers and fluent English language speakers and had completed PhDs. Then, a professional translator from the department of English Language Teaching, Hacettepe University back-translated the translated versions independently. A linguist with an English Language PhD compared the back-translated version with the original version for meaning accuracy. Finally, the meanings of several words were clarified and reworded.

Participants in samples were contacted via students who were retirees' children, relatives, and acquaintances in classes during the pedagogic formation program in the school of education in Isparta City, Turkey. The author of the research informed and trained the students about the study and the RSI inventory. Inventories that included consent instructions and information about the study and privacy policy were delivered to the students. The participants completed the forms at home, and the students returned them to the researcher. All participants were informed that the responses would be kept anonymous and only the research data would be reported. Finally, another subgroup of 38 participants participated in a retest and filled out the survey forms.

Measures

Retirement Satisfaction Inventory –RSI (1). Original Inventory had three scales: Reasons for retirement (15 items:4-18), Satisfaction with life in retirement (11 items:20-30), Sources of enjoyment (15 items:36-50) and group of items measuring transition of pre (3 items: 1, 2, 3) and post retirement (2 items:31, 32), other reasons for retirement (1 item for coun-

seling purpose: 19), social activity (3 items: 33, 34, 35) and overall satisfaction (1 item:51). The first three items measuring pre-retirement work functioning and anticipated retirement satisfaction investigate the *meaning of the person's earlier working condition and their expectations regarding retirement satisfaction*, using a seven-point scale (1=*"not at all"*, 7=*"very much"*). A total of 15 items (scale of reasons for retirement), between 4 and 18, *searched for reasons for retirement*, using a seven-point scale (1="*very unimportant*", 7="*very important*"). Also, *an open-ended response*, item 19, was included for counseling purposes, and this item was not considered in the analysis. A total of 11 items (scale of satisfaction with life retirement), between 20 and 30, evaluated *current satisfaction level with life in retirement* with various aspects, using a seven-point scale (1=*"very dissatisfied"*, 7=*"very satisfied"*). Items 31 and 32 investigated *retirement adjustment and change*. Item 31 investigated the ease or difficulty in the period following retirement, using a seven-point scale (1=*"very difficult"*, 7=*"very easy"*). Item 32 investigated the retiree's quality of life in pre-retirement, using a seven-point scale (1=*"much worse"*, 7=*"much better"*). Items 33, 34 and 35 investigated *current activities* with a five-point scale (from 1 *"never"* to 5 *"always"*). The following items (scale of sources of enjoyment) between 36 and 50 investigated *sources of enjoyment*, using a five-point scale (1=*"very unimportant"*, 5=*"very important"*). Item 51 investigated *global satisfaction with retirement* and evaluated general satisfaction, using a seven-point scale (1=*"very dissatisfied"*, 7=*"very satisfied"*).

Life satisfaction scale. The Life Satisfaction Scale was developed by Diener, Emmons, Larsen, and Griffin (5) and adapted into the Turkish by Durak, Durak and Gencoz (6). It is a Likert-type scale composed of five items, each with seven options. The minimum and maximum scores range from 7 to 35. The scale's test-retest reliability is 0.85. In the present study, the scale's internal reliability score was 0.81.

Data Analysis

All preliminary analyses, Pearson's correlations, and EFA (exploratory factor analysis) were performed using SPSS version 15 for Windows (SPSS Inc., Chicago, IL, USA). CFA (confirmatory factor analysis with maximum likelihood [ML]) estimation and fit statistics were conducted using AMOS 22.0 (SPSS Inc., Chicago, IL, USA).

Results

Prior to the analysis, assumptions were checked. For the normality assumption, the skewness and kurtosis values were calculated, and the values were in an acceptable range for a normal distribution. The numeric variables were converted to their standard z-score values to detect univariate outliers and those smaller than -3 and larger than +3 were excluded. Finally, the assumptions of linearity and homoscedasticity were met.

As conducted in Floyd et al. (1), three sets of factor analysis were conducted on three parts of the inventory measuring reasons for retirement (15 items), satisfaction with life in retirement (11 items), and sources of enjoyment (15 items).

Reasons for Retirement (RFR)

CFA indicated original model indices did not suggest an acceptable fit to the data. Therefore, EFA was conducted to explore factor structure of original 15-item RFR. The data's adequacy for factor analysis was supported by a Kaiser's measure of a sampling adequacy value of 77. Principal-component analyses were followed by Varimax rotation of factors with eigenvalues greater than one and loading more than one item (Table 1).

Three items with poor loadings (items 4, 14, and 18 <.30) were deleted. The most appropriate solution suggested a 12-item four factor model. The items assessing the reason for retirement produced four factors labeled: pressure from employer (PE, 4 items), pursue own interests (OI, 3 items), job stress (JS, 3 items), and retirement due to circumstances (RC, 2 items). The total variance explained by the four factors was 59.1%. Factor 1 (PE) consisted of items 8, 9, 10 and 11, explaining 30.0% of the variance. Factor 2 (OI) included items 7, 12, and 13, explaining 12% of the variance. Factor 3 (JS) contained items 15, 16, and 17, explaining 9% of the variance. Factor 4 (RC) consisted of items 5 and 6, explaining 8.2% of the variance. Based on the EFA results, the four-factor model with 12 items was consequently tested using CFA with the maximum likelihood method for generalizability and validation of the model. The CFA results demonstrated the model adequately described the data (χ^2/ df=1.95, CFI=.91, RMSEA=.06). Parameter estimates ranged from .32 to .87. Intercorrelations among the four subscales of the reasons for retirement ranged from .06 to .37.

Satisfaction with Life in Retirement (SLR)

CFA was conducted using the three-factor model proposed by Floyd et al. (1). The model indices were as follows: ^{2}/ df=1.50,



Table 1— EFA: Scale of Reasons for Retirement.

Items	PE	OI	JS	RC	M	SD
10.Pressured by employer	**.78**	.09	.14	.10	1.61	1.97
8.Laid off, fired, hours reduced	**.76**	.03	.09	.21	1.55	1.67
9.Difficulties with people at work	**.72**	.23	.19	.04	1.65	1.22
11. Offered incentives	**.67**	-.02	.29	.15	1.80	1.39
13. Wanted time for own interests	.03	**.86**	.11	.10	3.38	1.84
12. Wanted time with family	-.02	**.81**	.18	.05	3.73	1.88
7. Could finally afford retirement	.39	**.48**	-.10	.16	2.33	1.52
16.Too much stress at work	.26	.08	**.80**	-.07	2.55	1.69
15. Disliked job	.11	.14	**.73**	.05	2.08	1.54
17. Difficulty with physical demands	.15	.05	**.68**	.25	2.46	1.68
5. Poor health	.12	.04	.24	**.74**	2.38	1.71
6. Spouse's poor health	.32	.13	.17	**.70**	2.12	1.61
Eigenvalue	4.49	1.78	1.36	1.23		
% variance	30	12	9	8		
Alpha	.75	.78	.70	.63		

CFI=.70, RMSEA=.10, suggesting an unacceptable fit. Thus, EFA was conducted to explore the factor structure of the 11 item RSI. Principal-component analysis was conducted followed by Varimax rotation of the factors with eigenvalues greater than one and loading by more than one item. The data's adequacy for factor analysis was supported by a Kaiser's measure of a sampling adequacy value of 0.78. These items produced two factors labeled satisfaction with health, activity, marriage, and home (HAM, 8 items) and satisfaction with services and resources (SR, 3 items). Thus, the most appropriate solution suggested an 11-item two-factor model explaining satisfaction in retirement. The total variance explained by two factors was 48%. Factor 1 (HAM) included items 20, 21, 22, 23, 24, 25, 26, and 27, explaining 32% of the variance. Factor 2 (SR) contained items 28, 29, and 30, explaining 16% of the variance (Table 2).

Following the EFA results, a two-factor model with 11 items was tested using CFA with a maximum likelihood for

Table 2— EFA: Scale of Satisfaction with Life in Retirement.

Items	HAM	SR	M	SD
20.Marriage	**.67**	-.09	4.85	1.15
22.Physical Health	**.62**	.11	4.30	1.25
24.Quality of residence	**.59**	.10	4.32	1.23
21.Financial situation	**.56**	.24	4.14	1.27
25.Relations with extended family	**.55**	-.01	4.72	1.07
23.Spouse's health	**.52**	.10	4.00	1.39
27.Access to transportation	**.49**	.12	4.58	1.28
26.Level of physical activity	**.41**	.22	3.85	1.25
29.Goverment services	-.02	**.93**	3.73	1.37
28.Community agency services	.08	**.69**	3.44	1.33
30.Personal safety	.34	**.41**	4.22	1.31
Eigenvalue	3.50	1.77		
% variance	32	16		
Alpha	.78	.71		

Table 3— EFA: Scale of the Social Activity.

Items	SA	RS	FC	M	SD
44.Retirement groups	**.73**	.15	-.01	2.54	1.16
46.Volunterism	**.61**	.26	.17	2.68	1.18
48.More time to think	**.61**	.34	.31	3.00	1.14
42.More travel	**.52**	.25	.32	2.81	1.25
39.More time with friends	**.50**	.11	.33	3.09	.86
43.Less stress	.14	**.68**	.19	3.19	1.15
47.Less anxiety	.37	**.62**	.10	2.90	1.15
40.Control over own life	.10	.42	**.68**	3.30	1.02
38.More time with family	.13	.07	**.58**	3.53	.84
36.Freedom to pursue own interests	.23	.26	**.47**	3.35	.90
Eigenvalue	4.85	1.40	1.04		
% variance	42	12	9		
Alpha	.83	.70	.68		

the generalizability and validation of the model. The CFA results indicated the model sufficiently explained the data (χ^2/ df=2.27, GFI=.93, AGFI=.89, CFI=.90, RMSEA=.07). Parameter estimates varied between .42 and .87. Inter-correlation among two subscales of the satisfaction in retirement was .37.

Sources of Enjoyment (SE)

A CFA was conducted using AMOS for the stability of the original structure of the three-factor Sources of Enjoyment (1). The model indices were χ^2/ df=3.08, GFI=.84, AGFI=.78, CFI=.72, RMSEA=.12 suggesting the fit of the model to the data was unacceptable. Then, an EFA and CFA were conducted to further discover the factor structure of the 15-item RSI-SE (Table 3).

The data's adequacy for factor analysis was supported by a Kaiser's measure of sampling adequacy value of .88. A principal-component factor analysis with Verimax rotation was conducted. The items with poor loadings (37, 41, 48, 49, and 50 <.30) were deleted. EFA was repeated with the remaining items with a three-factor solution, as suggested by Floyd et al (1). The most appropriate solution suggested a 10-item three-factor model. The total variance explained by three factors was 60%. Finally, factor 1 (SA) contained items 39, 42, 44, 46, and 48, explaining 40% of the variance. Factor 2 (RS) included items 43 and 47, explaining 12% of the variance. Factor 3 consisted of items 36, 38, and 40 explaining 9% of the variance.

Depending on the EFA results, the three-factor model with 10 items was finally applied using CFA with a maximum likelihood for the generalizability and validation of the model. The results indicated a good fit of the three structures of the 10-item RSI-SE to the data with values of χ^2/ df=2.54, GFI=.93, AGFI=.89, CFI=.87, RMSEA=.07. The 10 items produced three factors labeled social activity (SA, 5 items), reduced stress/responsibilities (RS, 2 items), and freedom and control (FC, 3 items) accounting for 61% of the total variance in sources-of-enjoyment. Parameter estimates varied between .49 and .68. Inter-correlations among three subscales of the satisfaction in retirement were .34, .48, and .61.

Internal Consistency and Test-retest Reliability

Alpha values were adequate to strong: RSI-T total scale=0.83, RFR total=0. 82 (PE=0.75, OI=0.78, JS=0.70, RC=0.63), SLR total=0.78 (HAM=0.78, SR=0.71), and SE=0.83 (SA=0.83 , RS=0.70, FC=0.68). Test-retest correlations were computed for the overall mean satisfaction scores, three sets of factor scores, and the other individual items measuring pre-retirement work functioning, adaptation, and change associated with retirement as well as participation in activities. Correlations for the two tests ranged from r=.49 to r=.79 (mean r=.70) for multiple-item scales and from r=.58 to r=.73 (mean r=.71) for the single-item ratings.

Concurrent Validity

Concurrent validity was evaluated by four scores from the RSI-T assessing existing satisfaction in retirement: overall mean score for the satisfaction items, the scores of two subscales obtained from the items, and the global rating of retirement satisfaction. As expected, the overall mean satisfaction



Table 4— Correlations among Retirement Satisfaction Scores (RSI-T)[a] and Life Satisfaction Scale.

	1	2	3	4	5
1. Mean of satisfaction items	-				
2. Satisfaction with health, marriage, home	.92*	-			
3. Satisfaction with life in retirement	.67*	.32*	-		
4. Global retirement satisfaction rating	.25*	.20*	.21*	-	
5. Life Satisfaction Scale	.49*	.45*	.32*	.28*	-

*P< 0.01

[a]Turkish version of Retirement Satisfaction Inventory.

score, the scores of two subscales, and the global rating of retirement satisfaction were positively associated with life satisfaction (Table 4).

Discussion

The present study's results supported the RSI original with three scales and nine individual items, but CFA with original RSI yielded an unacceptable fit to the data, although some indices were high. Therefore, a series of EFA and the calibration sample and CFA on a cross-validation sample were conducted. The adaptation of the Turkish version of RSI was structured in three scales and nine individual items consistent with RSI original (1) RSI-French (2), RSI-Italian (4), and RSI-Spanish (3): reasons for retirement, current satisfaction with retirement, sources of enjoyment and individual items measuring pre-retirement functioning, adjustment and change, current activities, and global satisfaction, with some differences regarding the factors' surface structure, which might be related to cultural differences.

Considering the scale of reasons for retirement, the number of items and subscales are consistent with Floyd et al. (1) and Zaniboni et al. (4) but differ from Fouquereau et al. (2) and Fernandez et al. (3) in terms of the number of items. However, the present study is different in the number of subscale items. For example, item 18 (spouse wanted) was included in the factor of job stress, and item 7 (afforded financially) was included in the subscale of own interests, which might be due to close Turkish family relationships.

Further discrepancy exists between two sets of results in terms of satisfaction with life in retirement. The main difference is concerned with the number of the factors. RSI-T has two main factors composed of satisfaction with health, marriage, home, and satisfaction with services, while RSI original has three factors (satisfaction with health, satisfaction with marriage and home, and satisfaction with services). Two factors (satisfaction with health and satisfaction with marriage and home) were combined to form one factor, in line with Fernandez et al. (3). Items 27 (access to transportation) and 21 (financial situation) were included in factor 1 concerning satisfaction with health, marriage, and home instead of in factor 2 (satisfaction with services).

Finally, in sources of enjoyment, the factor structure observed in the Turkish sample was similar to American RSI with some differences. Items 37 (not having to work), 41 (no boss), 49 (more relaxed), and 50 (can be alone more) with poor loadings were deleted. Items 48 (more time to think) and 42 (more travel) were included in factor social activity, and item 38 (more time with family) was included in factor freedom and control. The main difference might be due to collectivist form of Turkish culture and family structure, in which individual and family experience emotional interdependence (7,8).

The current study also has some limitations. Cross-sectional designs provide information about the population's current condition; however, this cross-sectional does not allow cause-effect relationships to be established. Another limitation was that the participants included were drawn from a convenient sample of retirees. In this study, only the Global Life Satisfaction Scale was used for concurrent validity, but future studies should use other scales, such as the life satisfaction scale for elders, scale of social support, and scale of self-esteem. Alternatively, a comparative cross-cultural study might be conducted. Overall, the RSI-T appears to be a leading valid and reliable instrument for determining the level of retirement satisfaction, reasons for retirement, and sources of retirement satisfaction in Turkish culture. However, it could be suggested that RSI should be assessed in other non-Western cultures as well.

Conflict of Interest

The author has no financial disclosures to declare and no conflicts of interest to report.

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RESEARCH

DEVELOPING A HOME HEALTH CARE NEED SCALE FOR THE ELDERLY

ABSTRACT

Introduction: This study aims to establish a national scale to determine the dependence of elderly individuals and their need for homecare services.

Materials and Method: Initially, we selected 30 questions. Based on feedback from the specialists, three items were excluded from the questionnaire. Logistic regression analyses were used to determine the items that were more effective of the 27 items for home health care needs assessment in the elderly. The resulting scale comprised nine items. Construct validity was assessed using factor analysis, specifically principal component analysis. A Receiver Operating Characteristic was constructed by calculating the specificity and sensitivity of the scale cut-off values.

Results: According to factor analysis, factors were named "activities of daily living (five items)" and "medical conditions (four items)." Cronbach's alpha value was 0.803. Home Health Care Need Scale for the Elderly scores were highly correlated with Katz Activities of Daily Living(r=-0.907) and Barthel Index (r=0.900) by Spearman's rank correlation analysis. An Area Under Curve of 0.860 was found in our study. The analysis indicated that a cut-off score of two had a sensitivity and specificity of 68.2% and 92.9%, respectively.

Conclusion: The Home Health Care Need Scale for the Elderly is a reliable and efficient scale for determining homecare need. The scale must be administered in larger field studies.

Key Words: Elderly; Homecare Need Scale; Activities of Daily Living; Scale Development.

ARAŞTIRMA

YAŞLILARDA EVDE SAĞLIK HİZMETİ İHTİYACI BELİRLEME ÖLÇEĞİ'NİN GELİŞTİRİLMESİ

ÖZ

Giriş: Çalışma, evde sağlık hizmetlerinin sunumunda ulusal standarttın sağlanabilmesi için bağımlılık düzeyini esas alıp evde sağlık hizmeti ihtiyacını belirleyecek bir ölçek geliştirmesi amacıyla yapılmıştır.

Gereç ve Yöntem: Başlangıç anketi 30 sorudan oluşmakta idi. Uzman görüşleri alındıktan sonra 3 soru anketten çıkarıldı. Kalan 27 soru içerisinden yaşlılarda evde sağlık hizmeti ihtiyacını belirlemedeki daha etkin sorular lojistik regresyon analizi sonuçlarına göre belirlendi. Ölçeğin son hali 9 sorudan oluşmakta idi. Yapı geçerliliğini belirlemek amacıyla faktör analizi yapıldı. Ölçeğin güvenilirliğini belirlemek için, Cronbach alfa iç tutarlılık katsayısı ve madde-toplam korelasyonları hesaplandı. Ölçeğin kestirim değerlerinin duyarlılık ve özgüllüğünü belirlemek amacıyla Reciever Operating Characteric analizi yapıldı.

Bulgular: Kaiser-Mayer-Olkin katsayısı 0.847 olarak hesaplandı. Faktör döndürme sonrasında ölçeğin birinci alt boyutunun 5 maddeden (günlük yaşam aktiviteleri), ikinci alt boyutunun 4 maddeden (tıbbi durumlar) oluştuğu belirlendi. Cronbach alfa katsayısı 0.803 olarak hesaplandı. Yaşlılarda Evde Sağlık Hizmeti İhtiyacı Belirleme Ölçeği, Katz Ölçeği (r=-0.907) ve Barthel indeksi ile yüksek korelasyon gösterdi. Reciever Operating Characteric analizi'nde eğri altında kalan alan 0.860'dı. Ölçeğin kesim noktası 2 olarak belirlenmiş olup, duyarlılığı %68.2 ve özgüllüğü %92.9 olarak saptandı.

Sonuç: Yaşlılarda Evde Sağlık Hizmeti İhtiyacı Belirleme Ölçeği evde sağlık ihtiyacını belirlemede kullanılabilecek etkili ve geçerli bir ölçektir. Ölçeğin daha geniş gruplarda uygulanması önerilmektedir.

Anahtar Sözcükler: Yaşlı; Evde Bakım Ölçeği; Günlük Yaşam Aktiviteleri; Ölçek Geliştirme

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INTRODUCTION

As life expectancy increases, it is obvious that the number of chronically ill and bedridden patients will increase (1). To address this situation, different models of healthcare are being proposed. One model is to provide homecare for elderly patients in their homes (2). The notion of homecare began with changes in social characteristics. Homecare for elderly patients must be coherent with social services, responsive to the needs of the society, consistent with standards, and should be applicable to a large portion of society with the resources at hand (3).

Although Turkey has a fast aging population, it has only recently started to provide this service (4). Homecare was pioneered in the private sector, however, it is provided by local authorities, private healthcare institutes, private homecare establishments, and government-owned hospitals' homecare facilities. However, accessing these facilities is problematic in rural areas and suburbs. This problem can only be solved by integrating homecare into primary care health services (5).

Providing standardized homecare requires determining the population who is in need of this service. As in many other countries, no standard determination method for elderly homecare services exists in Turkey. The reason for this is that there is no objective, scientific determination scale describing homecare services. Some scales are being developed to evaluate systemic diseases in determining the need for homecare. However, no scale exists to determine patient dependence on others to obtain primary care.

The purpose of this study was to establish a national scale to determine the dependence of elderly individuals and their need for homecare services.

MATERIALS AND METHODS

Study Group

The study was conducted in Eskisehir where the majority of people are engaged in agriculture in rural areas and industry is located in Central Anatolia, Turkey. The total population is 781,247, and the population over 65 years of age is 80,086 (10.0%). Of the residents, 83% live in the city center and 17% live in rural areas.

There are two universities and a medical school in Eskisehir. Health education and research in Eskisehir is conducted at the Public Health Department of Eskisehir Osmangazi University Medical School Education and Research Regions (ESOGU-ERR), which engages in community-based research. ESOGU-ERR includes four semi-rural areas (Sivrihisar, Beylikova, Mahmudiye, Alpu). During the study period, we reached out to all households (n = 7,524) and interviewed 2,915 (38.7%) households in ESOGU-ERR. The demographic characteristics of 9,855 individuals were recorded. The study was performed on 1,018 (10.3%) individuals who were aged 65 years and above.

Procedure

The study was reviewed and approved by the Ethics Committee and the relevant institutions. All participants gave informed consent. Participants completed a questionnaire on socio-demographic characteristics, including age, sex, socioeconomic status, family status, personal care status, smoking status, use of medical consumables (Foley catheter, nasogastric tube, colostomy bag, dialysis catheter, intravenous catheter, cystoscopy catheter, and percutaneous endoscopic gastrostomy), medical equipment (respiratory apparatus, wheelchair, air bed), and status of physician-diagnosed diseases.

The questionnaire also included the Katz index of independence in activities of daily living (Katz ADL) and the Barthel index (BI).

The Katz ADL has been used to quantify independence in ADL across a wide range of patient populations. Functional disability was measured in terms of limitations in daily activities using the Katz ADL; the included items were bathing, transferring, dressing, toileting, continence, and feeding. The response categories provided were "independent" (the person needs no help), "semi-dependent" (the person needs minimal help to perform the activity), or "dependent" (the person needs assistance to perform the activity) (6).

The BI comprises ten items: feeding, moving from wheelchair to bed and vice versa, getting on and off the toilet, bathing, walking on a level surface, ascending and descending stairs, dressing, and controlling bowels and bladder (7). Each item is scored on a three-point scale, where 0=completely dependent, 1=some help needed, and 2=completely independent. Items are weighted and summed to yield a score ranging from 0 to 100, where higher scores indicate total independence. The BI has also been translated into Turkish by Kucukdeveci et al. The Cronbach's α value for the BI was 0.93 (8).

The questionnaire was completed by the researchers using a face-to-face conversation method. Physicians experienced in homecare services examined all participants. Examination findings (state of consciousness, patient's general appearance,



state of being bedridden, and state of oral intake) were noted. Physicians determined the homecare needs of individuals according to the medical examination, values of the ADL indexes, and patient history. Information was obtained during a 25–30 min period.

Evaluation of the Home Health Care Need Scale for the Elderly (HHCNSE)

The HHCNSE comprises two parts: activities of daily living and medical conditions. The HHCNSE items related activities of daily living were prepared based on the Katz ADL and BI, the most commonly used and accepted indexes. We selected 30 questions from the Home-Based Long-Term Care report by the WHO (2000) for home health care needs and criteria from the Public Health Institution of Turkey to determine the item-related medical conditions (9,10).

Ten specialists' (four epidemiologists, five physicians in homecare services, and one language specialist) opinions on the questionnaire were obtained. According to the specialists, three items were unnecessary and were excluded from the questionnaire. Logistic regression analyses were used to determine the items that were more effective of the 27 items for home health care needs assessment in the elderly. Home health care need status was the dependent variable in the model. The scale was developed by combining the items with test values of $p<0.01$. The resulting scale comprised of nine items. Specialists assessed the content validity of the scale. According to this assessment, the specialists reported that the scale had suitable content, expression, and scope.

Factor Analysis

To determine the qualities measured by the scale and examine the meaning of the total scores, construct validity was assessed using factor analysis, specifically principal component analysis. To assess the adequacy of sample size Kaiser-Meyer-Olkin (KMO) test was applied. The KMO result was >0.50, and factor analysis was performed.

Because all the items exhibited factor loadings of >0.40 in the analysis(11), there was no need to remove items. Of the available factor rotation methods, the equamax rotation method was selected. According to factor loadings obtained from the factor analysis, items pertained to a sub-dimension according to their maximum factor weight. Two sub-dimensions were identified by the factor analysis.

Internal Consistency

Cronbach's alpha coefficient and item-total correlations were calculated to analyze the reliability of each subscale. Items greater than 0.20 of total item correlation were considered reliable. Correlation analysis was used to assess internal consistency reliability. The correlation coefficient must not be negative or below 0.20. Items were divided into two groups according to if items were single or double, and consistency between the two groups was tested using Spearman's correlation analyses.

Discriminative Validity

The BI and Katz ADL serve as indicators of functional limitation. The scores of these indexes were compared to the HHCNSE to assess the validity of the HHCNSE by Spearman's correlation. The discriminative validity of the scale compares the group scores.

In testing the construct validity of the scale, the following hypothesis was established: median HHCNSE scores will be higher for individuals for whom physicians recommend home health care need(s) than for people who have not received such a recommendation. Therefore, the total scores of the study group were compared using a Mann-Whitney U test.

Scoring

The final scale comprised nine items with two sub-dimensions. Each item was worth 1 point. The maximum score was 9 for the entire scale, 5 for the activities of daily living sub-dimension, and 4 for medical conditions. The minimum score was zero for the entire scale and sub-dimensions.

In the first sub-dimension of the scale (activities of daily living), each item was scored on a two-point scale, where 0=completely independent and 1=completely dependent. In the second sub-dimension of the scale (medical conditions), each item was also scored on a two-point scale, where 0=no use of medical consumables and 1=use of medical consumables; 0=clear consciousness and 1=closed consciousness; 0=not bedridden and 1=bedridden; 0=no use diaper and 1=use diaper. The reference standard was the present home health care need(s) decision of the physician. A receiver operating characteristic (ROC) curve was constructed by calculating the specificity and sensitivity of the scale cut-off values, and the area under the curve (AUC) was computed. The optimal cut-off point was defined as the point at which the sum of sensitivity and specificity was maximal.

Statistical Analysis

IBM SPSS Statistics for Windows, Version 20.0. (IBM Corp. Armonk, NY) was used for the data analysis. The demographic characteristics of the study group were reported using descriptive statistics (frequencies, proportions, means, medians) and dispersion measures (standard deviation, min-max). Initially, the normality of the total scores was tested using the Kolmogorov-Smirnov normality test and graphs. Therefore, the median scores were compared using Kruskal Wallis (and Bonferroni's ad hoc test) and Mann-Whitney U tests.

RESULTS

The study group comprised 1,018 (10.3%) participants aged over 65 years old. Of these, 443 (43.5%) were male and 575 (56.5%) were female. The mean age of the participants was 73.8± 6.62 (range 65–98 years). Of the participants, 764 (75.0%) lived alone or with their partner, and 254 (25%) lived with their extended family. Physicians in the study team determined that 267 (26.3%) of the participants needed homecare.

The logistic regression model determining the HHCNSE items for home health care need assessment is presented in Table 1.

The construct validity of the HHCNSE was assessed using factor analysis. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.847. Bartlett's test of sphericity was significant (x^2=2876.1, df=36, p<0.001). According to the results, HHCNSE extracted two factors whose eigenvalues were greater than 1.0, which accounted for 54.1% of the variance in scores. There was no need to remove any items. It was determined that the first sub-dimension comprised five items (one–five items) and the second sub-dimension comprised four items (six–nine items). The first sub-dimension factor loadings varied between 0.408 and 0.857, and the second sub-dimension factor loadings varied between 0.544 and 0.763. The factors were named "activities of daily living" and "medical conditions." The items included in the final scale, along with their factor loadings, variance, and Cronbach's

Table 1— Logistic Regression Model Determining the HHCNSE Items for Home Health Care Need Assessment.

HHCNSE items	p	OR	95%CI
Feeding	<0.001	12.425	8.44-18.28
Self-Care	<0.001	19.358	13.24-28.30
Bathing	<0.001	3.557	2.42-5.24
Toileting	<0.001	33.260	21.45-51.58
Transferring	<0.001	19.956	14.07-28.30
Consciousness	<0.001	17.709	6.76-46.38
Being bedridden	<0.001	37.855	13.47-106.41
Using diaper	<0.001	37.860	13.46-106.41
Using medical equipment	<0.001	9.474	3.74-23.99

Table 2— Items Included in the Final Scale and Factor Loadings, Variance and Cronbach's Alpha Scores for Each Item.

Sub-dimensions	Items	Factor Loading	
		1	2
Activities of Daily Living	Feeding	0.709	
Explained Variance:%33.059	Self-Care	0.830	
Cronbach's alpha: 0.818	Bathing	0.408	
	Toileting	0.857	
	Transferring	0.851	
Medical Condition	Consciousness		0.656
Explained Variance:%21.014	Being bedridden		0.763
Cronbach's alpha: 0.763	Using diaper		0.544
	Using medical equipment		0.648
Total Variance: %54.073	**Total Cronbach's alpha:** 0.803		

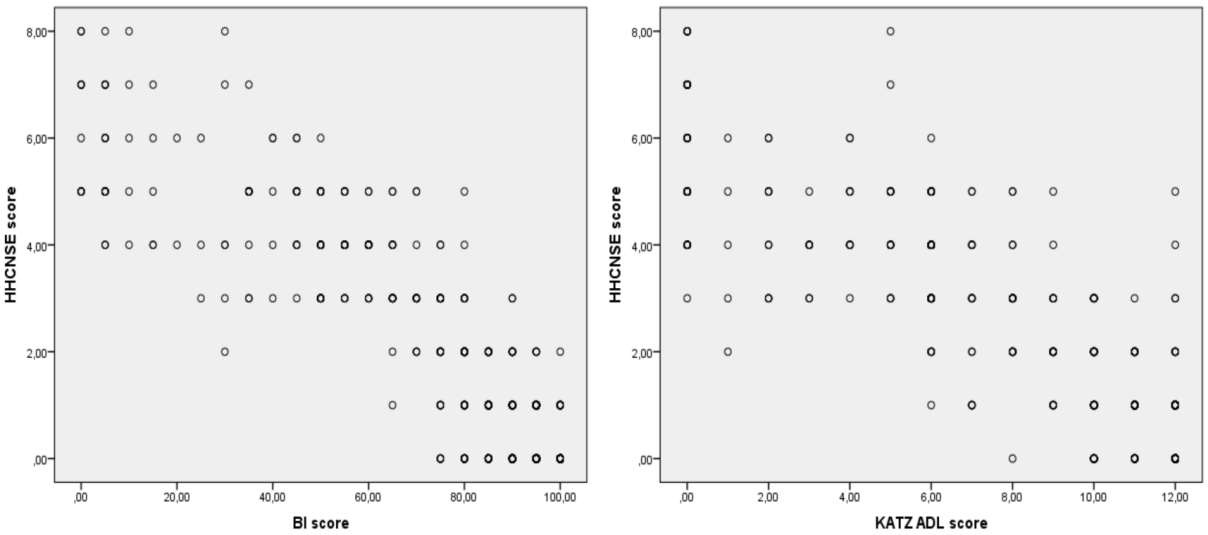


Figure 1a and 1b— A scatter plot of the HHCNSE with BI and Katz ADL scores.

alpha scores, are presented in Table 2.

Internal consistency was assessed by calculating Cronbach's alpha, and the value was 0.803 for HHCNSE. The deletion of any item from the questionnaire produced Cronbach's alpha values that ranged between 0.747 and 0.811. The Cronbach's alpha values for the activities of daily living and medical conditions subscales were 0.823 and 0.611, respectively. The corrected item-total score correlation coefficient was a minimum of 0.267 and a maximum of 0.776, which was significant. The results of the split half reliability between the even -and odd- numbered items yielded a Spearman's correlation coefficient of 0785; p <0.001.

In terms of discriminative validity, HHCNSE scores were highly correlated with Katz ADL (r=-0.907; p<0.001) and BI (r=-0.900; p<0.001) by Spearman's rank correlation analysis. Scatter plots of the HHCNSE with Katz ADL and BI scores are shown in Figures 1A and 1B.

The mean, standard deviation, median, and min-max of total scores taken from the scale were 1.03±1.72 and (0–8). We used a ROC curve to determine the cut-off point for HHCNSE. HHCNSE score of two generates the best cut-off point at which the sum of sensitivity and specificity was maximum (Table 3). An AUC of 0.860 (95%CI=0.827–0.881) was found in our study. The analysis showed that a cut-off score of two had a sensitivity and specificity of 69.1% (95% CI=63.1–74.6) and 93.0% (95% CI=90.9–94.7), respectively. Finally, according to the results, home health care should be considered for individuals with HHCNSE scores of two or higher. The ROC curve for HHCNSE and physician-recommended home health care is shown in Figure 2.

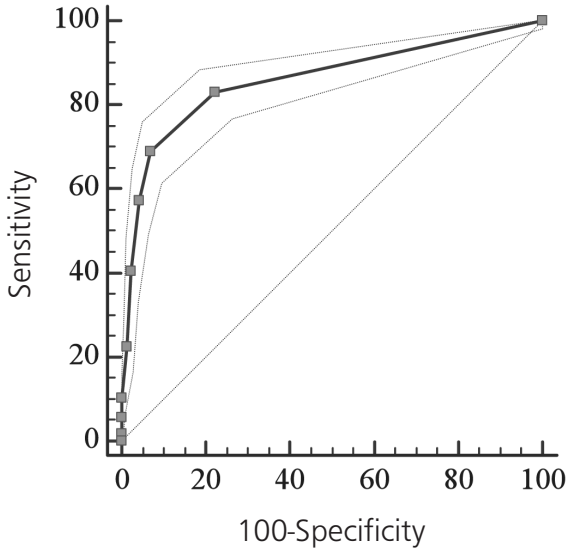


Figure 2— ROC curve for HHCNSE and physician-recommended home health care.

As a last fact, the distributions of physician-recommended home health care with HHCNSE, Katz ADL, and BI are presented in Table 3.

Table 2— The Distribution of Physician-recommended Home Health Care With HHCNSE, Katz ADL and BI.

	Home Healthcare Need				
	Yes		No		
	Median	Min-Max	Median	Min-Max	Test Value (Z, p)
BI	100	5-100	65	0-100	Z=8.76; p <0.001
Katz ADL	18	6-18	13	6-18	Z=20.60; p <0.001
HHCNSE					
Activities Of Daily Living	0	0-5	3	0-5	Z=20.05; p <0.001
Medical Condition	0	0-2	0	0-3	Z=11.24; p <0.001
Total	0	0-6	3	0-8	Z=20.01; p <0.001

Discussion

Turkey is a country that is initiating homecare services. The planning must start by identifying those in need of these services. In this study, we aimed to develop a scale to determine the need for home health care in semi-rural areas among the elderly.

Globally, 23% of morbidity and mortality occurs among individuals who are 60 years of age or older. A large proportion of this burden is due to chronic illnesses (12). As life expectancy increases, temporary and permanent disabilities arising from these chronic illnesses also increase. The initiation of homecare has led elderly patients to prefer accessing healthcare through homecare rather than hospitals.

The results of The National Home and Hospice Care Survey, a social survey, state that 70% of homecare is given to individuals over 65 years of age (13). Therefore, the study focuses on the need for homecare in the elderly population.

Turkish traditions promote the care of the elderly be undertaken by their children. However, migration to urban areas and increasing female employment has led to a period of elderly people living on their own, and this is considered a major problem for the elderly. Informal care provided to these elderly people must be transformed to formal care in a standardized way by first determining those who are in need of this service. According to previous studies, individuals living in rural areas are in lower socioeconomic brackets, are older and have a higher incidence of hypertension, arthritis, diabetes, and heart-related illnesses. Additionally, it is reported that these individuals usually access healthcare via emergency services. Rural areas have access only to governmental primary care health services, whereas urban areas have other facilities and institutions that provide health care services. Therefore, the provision of homecare services must start in rural areas (14). According to a study conducted by McAuley et al, it is significantly easier to access homecare in urban areas compared to rural areas (15). Another issue is increasing the quality of informal care through integration with formal institutions. To produce standardized, healthy, and functioning homecare, individuals in need of this service must be identified in an efficient manner.

The lack of a scientific and objective evaluation procedure for determining the recipients of homecare services is the main reason for unequal and unjust homecare. Japan is the most important country that has implemented an objective evaluation procedure. In Japan, forms completed by applicants divide patients into six different homecare groups (16). In Europe, the ASIM system evaluates patients' dementia status, personal safety perceptions, urinary incontinence, movement ability, social care status, residence quality, residence usability, and functional capacity (17). In Turkey, bedridden status, consciousness state, usage of medicinal equipment, medical state, nutrition, self-care, movement, washing, and dressing are considered regardless of social care status. In this study, standard criteria in the HHCNSE have been developed for planning the homecare system and effective usage of health labor.

For internal consistency, Cronbach's alpha should be higher than 0.70. Dividing the test questions into two groups by even and odd question numbers resulted in acceptable correlation levels. The correlation between items and the whole test was evaluated. The acceptable correlation value was 0.20 (18); in our study, the total correlations were between 0.26 and 0.78.

The Katz ADL and BI were used to compare the developed scale and test results. The Katz ADL and BI are the most



frequently used scales for the evaluation of dependence. In this study, the Pearson product moment correlation coefficients between scale total score and Katz ADL and BI scores were sufficient (-0.907 and -0.900, respectively). Medical homecare must be provided to everyone in need of it, regardless of family care at home. Evaluations of patients' independence and medical situation are important in determining their need for homecare. The inclusion of these factors in population screening will result in the just allocation of homecare. As stated by Anderson and Newman, medical state and handicap status are the most important factors in providing homecare. In many studies, patients not receiving homecare indicated that they felt more functional and healthy compared to homecare patients(19).

When observing HHCNSE's constructional validity, the varimax axle rotation technique was used in factor analysis. Two factors stood out in the result of the analysis. The ROC analysis for approximation value showed that the area under the curve was 86%. The HHCNSE successfully evaluated 86% of the population's need for homecare, and the scale is an efficient tool for this purpose (20).

As a conclusion, the HHCNSE is a reliable and efficient scale for determining homecare need. The scale must be administered in larger field studies.

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RESEARCH

INVESTIGATING THE FREQUENCY AND CAUSES OF DIFFICULT MASK VENTILATION IN INTRAOPERATIVE IN GERIATRIC PATIENTS

ABSTRACT

Introduction: The sunken cheeks of edentulous elderly patients may cause mask ventilation to be ineffective or even impossible. The aim of this study was to identify the frequency and causes of difficult mask ventilation in geriatric patients.

Materials and Method: This study was completed prospectively in 8 months, and included 264 patients that were ≥65 years old, undergoing elective operations. Difficult mask ventilation form 1 (demographic data, mouth opening measurements, mallampati score, thyromental and sternomental distance, mandibular protrusion test, neck movement and circumference, the presence of beard in male patients and their dental situation) and difficult mask ventilation form 2 (their experience as a mask ventilation user, difficulty of mask ventilation, using the opioid/neuromuscular blocker agent in induction of anaesthesia and maintenance of the airway) were completed.

Results: Surgical intervention was performed in 7948 (29%) patients aged 65 years and above. A total of 254 patients were included in the study. Patients were mean aged 72±6 and 58.7% male. Overall, 68.9% of patients had no teeth, whereas 31.1% had normal teeth/fixed prosthesis. 32.7% of patients had grade 1 difficult mask ventilation, 54.7% had grade 2 and 12.6% had grade 3 difficult mask ventilation. Grade 4 difficult mask ventilation was not observed. In male patients had beard 26.2% in grade 1, 46.3% in grade 2 and 66.7% had in grade 3 difficult mask ventilation.

Conclusion: In this study, the incidence of difficult mask ventilation in the geriatric patient population was 12.6%. The independent risk factors for difficult mask ventilation were identified as male gender, thickened neck circumference, the presence of a beard in male patients and the experience of the anaesthesiologist.

Key Words: Geriatric; Anaesthesia; Patient; Difficult Mask Ventilation.

ARAŞTIRMA

GERİATRİK HASTALARDA İNTRAOPERATİF ZOR MASKE VENTİLASYONU SIKLIĞININ VE NEDENLERİNİN ARAŞTIRILMASI

ÖZ

Giriş: Yaşlı ve dişsiz hastalarda yanakların çökük olması nedeniyle maske ventilasyonu efektif olmayabilir hatta imkansızlaşabilir. Bu çalışmanın amacı geriatrik hastalarda zor maske ventilasyonun sıklığının ve nedenlerinin saptanmasıdır.

Gereç ve Yöntem: Bu çalışma, 8 aylık bir dönemde, prospektif olarak, 65 yaş ve üzeri, 264 hasta ile elektif operasyon geçirenlerde yapıldı. Zor maske ventilasyon form 1 (Demografik veriler, mallampati skoru, ağız açıklığı, tiromental ve sternomental mesafe, mandibular protruzyon testi, boyun hareketleri, boyun çevresi, erkek hastalarda sakal bıyık varlığı ve dişlerinin durumu) ve zor maske ventilasyonun form 2 (maske ventilasyonu uygulayıcısının deneyimi, maske ventilasyon zorluğu, indüksiyonunda opioid/nöromuskuler ajan kullanımı, hava yolu idamesinin nasıl yapıldığı) kaydedildi.

Bulgular: Altmış beş yaş ve üstü 7948 (%29) hastaya cerrahi girişim yapıldı. Çalışmaya toplam 254 hasta dahil edildi. Hastaların ortalama yaşı 72±6 ve %58,7'si erkek idi. Hastaların %68,9'unun dişsiz, %31,1 dişlerinin normal/sabit protez olduğu gözlendi. Hastaların %32,7'si grade 1, %54,7'si grade 2 ve %12,6'sı grade 3 zor maske ventilasyonu olarak saptandı. Grade 4 zor maske ventilasyonuna hiç rastlanmadı. Erkek hastalarda sakal varlığı %26,2 grade 1, %46,3 grade 2 ve %66,7 grade 3 zor maske ventilasyonu olanlarda tespit edildi.

Sonuç: Bu çalışmada geriatrik hasta popülasyonunda zor maske ventilasyonu sıklığı %12.6 olarak bulundu. Erkek cinsiyet, boyun çevresinin kalın olması, erkek hastalarda sakal varlığı ve anestezistin tecrübesi zor maske ventilasyonu için bağımsız risk faktörü olarak saptandı.

Anahtar Sözcükler: Geriatrik; Anestezi; Hasta; Zor Maske Ventilasyonu.

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Introduction

Mask ventilation forms the basis of airway management. Providing mask ventilation before endotracheal intubation or other methods (e.g. tracheostomy or cricothyrotomy) is a basic but potentially life-saving airway technique that allows oxygenation and ventilation in patients without a reliable airway. Difficulty or failure in managing the airway of patients is an important factor in increased morbidity and mortality linked to anaesthesia (1).

Geriatric patients are now encountered more frequently in daily anaesthetic practice because of increased life expectancy, which continues to rise with increased living standards, and developments in anaesthesia, surgical techniques and medication that enable more difficult and complicated medical interventions (2). During anaesthesia induction, difficult or impossible mask ventilation accompanied by difficult intubation cause life-threatening complications in 0.4% of adult anaesthesia cases (3). Especially in geriatric patients, reduced upper airway tonus increases the possibility of airway obstruction, which can render mask ventilation difficult (4). Indeed, mask ventilation in old, toothless patients with sunken cheeks may be ineffective and even impossible. Thus, lack of teeth in geriatric patients is a known independent risk factor for difficult mask ventilation (DMV) (5). The incidence of DMV is observed to vary between 0.07% and 16% (3, 6–12). In addition to lack of teeth, Langeron et al. (13) identified having a beard, a body mass index (BMI)> 26 kg/m^2, or history of snoring, as well as being aged>55 years as independent risk factors for DMV. Kheterpal et al. (3) also found limited or severely limited mandibular protrusion, abnormal neck anatomy, sleep apnea, snoring, and body mass index of 30 kg/m^2 or greater were independent predictors of grade 3 or 4 DMV and difficult intubation.

The aim of this study was to determine the frequency and causes of DMV in geriatric patients.

Materials and Methods

This study was completed from November 2012 to Jun 2013 at a University Medical Faculty Anaesthesiology and Reanimation Department. Permission for the study was obtained from the Non-interventional (non-invasive) Clinical Research Assessment Commission on 15th November 2012 (protocol no. 787-GOA), and informed consent was obtained from all patients.

This was a prospectively planned study in which patients aged ≥65 with planned elective operations were identified from the daily surgery program one day in advance. The Difficult Mask Ventilation (DMV 1) form 1 was used to record the patients' age, gender, weight, body mass index (BMI), American Society of Anesthesiologists (ASA) physical status, Mallampati score, mouth opening measurement, thyromental distance, sternomental distance, mandibular protrusion tests, neck movements, neck circumference, presence of a beard in male patients and dental situation.

Patients taken to the operating room were subjected to routine monitoring of their heart rate, systolic arterial pressure, diastolic arterial pressure, mean arterial pressure, 3 lead electrocardiography (Derivation II) and peripheral oxygen saturation before anaesthesia induction.

Where patients wore false teeth, their teeth were removed prior to anaesthesia induction. Black rubber masks were used in the study. The proper mask size was decided according to a variety of facial features of each patient. All the patients were preoxygenised with 100% oxygen for 3 min by using a face mask. The anaesthetic administrator selected the type and dose of agents used during anaesthesia induction. During induction, 100% oxygen was administered with mask ventilation. The person who performed the mask ventilation completed the DMV 2 form. Via this form, the following was recorded: their experience as the ventilation operator (resident or specialist anaesthesiologist), opioid agent(s) of using for general anaesthesia induction and neuromuscular blocker agent during mask ventilation and experience of using the airway maintenance device; moreover, if the patient was intubated, the Cormack–Lehane score was recorded. The degree of DMV was defined as per the work by Han et al. (6) as follows: Grade 0: spontaneous respiration, ventilation without mask; Grade 1: ventilation with mask; Grade 2: mask ventilation with oral airway or other adjuvant (neuromuscular blocker agents); Grade 3: DMV (insufficient or unstable ventilation, or mask ventilation with two people) and Grade 4: ventilation impossible with mask.

Exclusion Criteria

The patients that were<65 years old, had experienced previous chin/facial surgery or radiotherapy in the neck region, had an ASA score of 5–6, were operated on under sedoanalgesia and regional anaesthesia, or those that were emergency cases were excluded from the study. The day case surgical patients who were admitted to the hospital on the day of their operation were excluded from the study because preoperative assessment could not be completed. Furthermore, only patients

operated on in the central operating rooms were included in the study, and patients with missing or erroneous DMZ 1 or DMZ 2 forms were excluded.

Statistical Analysis

Data obtained from this research were entered into a database created using the SPSS 15 (Statistical Package for Social Sciences) program, and the statistical analyses of the data were performed using the same program. Numerical variables are presented as the median, minimum, maximum and range values. Whether numerical variables and subgroups were normally distributed was determined normality by graphing the data or normality in the light of sample size. Where variables were not normally distributed, they were analysed using nonparametric methods, i.e. Kruskal–Wallis and Mann–Whitney U tests. Categorical variables were recorded as frequencies and percentages in diagonal tables; the distributions of these variables were compared using the Chi Square test. All the tests had 1st type error margins and $\alpha = 0.05$, and they were bilaterally tested. Where the p values were<0.05, the difference between the groups was accepted as statistically significant.

Results

During the 8 months, 27,381 surgical interventions were performed, and their distribution within the study is shown in Figure 1. Of the patients analysed, 20% had cardiovascular surgery, 23% had urologic surgery, 19% had brain surgery, 18% had general surgery, 7% had chest surgery, 6% had orthopaedic surgery, 3% had gynaecological and obstetric surgery, 1% had plastic surgery and 1% had ear, nose and throat surgery. The demographic data of the patients is shown in Table 1.

It was found that 32.7% of patients were classed as Grade 1 DMV cases, 54.7% as Grade 2 DMV and 12.6% as Grade 3 DMV, whereas Grade 4 DMV was not found. For patients with Grade 1, 2 and 3 DMV, the relationships between physical examination components is shown in Tables 2 and 3.

When comparing patients with Grade 1, 2 and 3 DMV, there were statistically significant differences between the groups in neck thickness (mean 42 cm) ($p< 0.001$). Therefore, pairwise comparisons were conducted. When Grade 3 DMV patients were compared with Grade 1 and 2 DMV patients in terms of gender, being male was significantly more

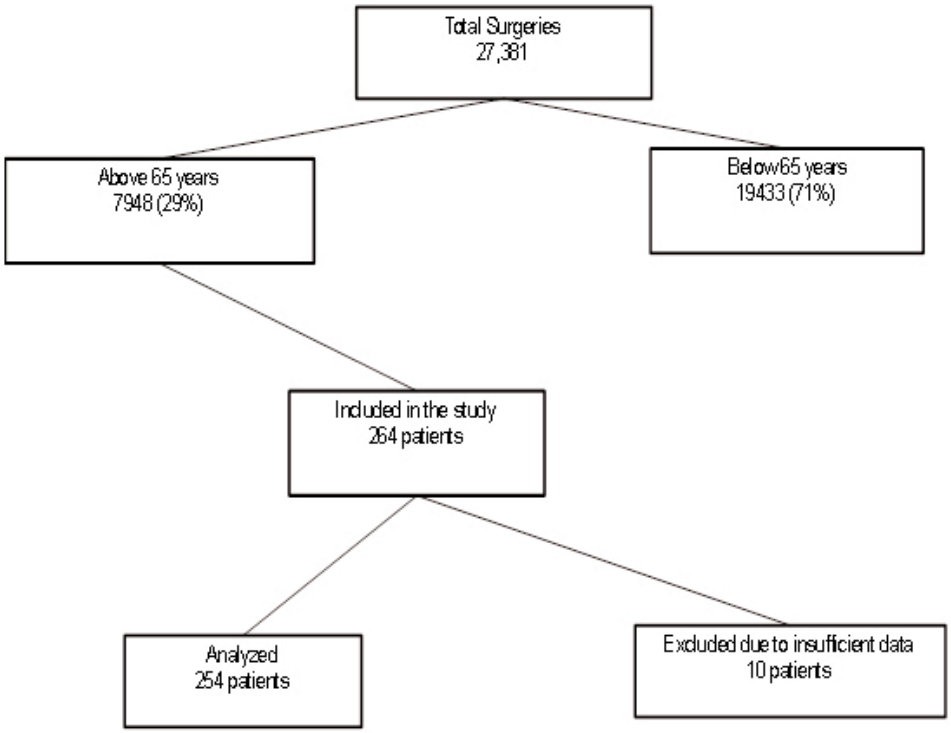


Figure 1— Flow chart.



Table 1— Demographic Data of the Patients and the Grade of Difficult Mask Ventilation.

Demographic Data	Grade 1 Mask Ventilation n= 83 32.7%	Grade 2 Mask Ventilation n= 139 54.7%	Grade 3 Mask Ventilation n= 32 12.6%	p
Age (year) (mean±sd)	72±6	73±5	74±7	-
Weight (kg) (mean±sd)	72±14	75±12	74±13	0.242
Height (cm) (mean±sd)	165±9	165±9	168±9	0.149
BMI (kg/m²) (mean±sd)	26.94±5.16	27,65±4,90	26,09±4,72	0.216
Gender (M/F) (n)	41/42	82/57	26/6	0.008*
ASA Class (1/2/3) (n)	0/55/28	-/91/48	-/18/14	0.571

*: p< 0.05

Table 2— Grade 1, Grade 2 and Grade 3 Mask Ventilation the Relationship Between Physical Examination Components.

Risk Factor	Grade 1 Mask Ventilation n (%)	Grade 2 Mask Ventilation n (%)	Grade 3 Mask Ventilation n (%)	p
Mallampati (1/2/3/4)	28/32/21/2	33/63/39/4	10/8/11/3	0,153
	33.7/38.6/25.3/2.4	23.7/45.3/28.1/2.9	31.3/25/34.4/9.4	
Cormach-Lehane (I/II/III/IV)	40/21/3/1	53/46/5/1	13/4/2/2	<0.001*
	61.5/32.3/4.6/1.5	50.5/43.8/4.8/1.5	61.9/19/9.5/9.5	
Mean mouth opening (cm) (min-max)	4 (3-6)	4 (3-6)	4 (3-6)	0.453
Thyromental distance (cm) (mean±SD)	10±1	10±1	10±1	0.446
Sternomental distance (cm) (mean±SD)	16±2	17±2	16±1	0.538

Table 3— Grade 1, Grade 2 and Grade 3 Mask Ventilation the Relationship Between Other Physical Examination Components.

Physical Examination Components	Grade 1 Mask Ventilation n (%)	Grade 2 Mask Ventilation n (%)	Grade 3 Mask Ventilation n (%)	p
Mandibular protrusion tests	71/8/4	110/24/5	30/2/-	0.106
Class A/ B/ C	85.3/9.6/4.8	79.1/17.3/6.3	93.8/6.3/-	
Neck movements				
Normal	76 (91.6)	125 (89.9)	27 (84.4)	0.520
Limited extension/flexion	7 (8.4)	14 (10.1)	5 (15.6)	
Presence of beard in male				
Yes	11 (26.2)	37(46.3)	18 (66.7)	0.004*
No	31 (73.8)	43 (53.8)	9 (33.3)	
Dental situation				
No teeth	52 (62.7)	97 (69.8)	26 (81.3)	0.147
Normal or fixed prosthesis	31 (37.3)	42 (30.2)	6 (18.8)	

*: p< 0.05

likely to be a risk factor for DMV in Grade 3 DMV patients (vs. Grade 1, p= 0.004; vs. Grade 2, p= 0.032). When the neck circumference of Grade 1 DMV patients was compared with that of Grade 2 and 3 DMV patients, the neck circumference was significantly greater in Grade 2 (p= 0.002) and Grade 3 (p= 0.001) patients. Thus, the neck circumference was a risk factor for increased difficulty of mask ventilation. In those surveyed patients, 44.1% had a history of snoring, whereas 55.9% had no history of snoring.

Resident and specialist anaesthesiologists performed mask ventilation for 89% and 11% of patients, respectively. The mask ventilation was statistically significant differences between experience of anaesthesiologist (p= 0.005). The anaesthesiologists ventilating Grade 1 DMV patients were found to have more mask ventilation experience than those ventilating Grade 2 DMV patients; moreover, mask ventilation became easier as experience increased (p= 0.001).

Opioids were used for anaesthesia induction in 91.7% patients, but were not used in 8.3% patients. At the induction stage, neuromuscular blocker agents were used for 56.3% patients and not used for 43.7% patients. When Grade 1, 2 and 3 DMV patients were compared, there was no statistically significant differences in the opioids used during anaesthesia (p= 0.051) or the neuromuscular blocker agent used during induction (p= 0.086).

After mask ventilation, 14.6% patients maintained their airway by using the classic laryngeal mask airway (LMA), 1.6% by the Proseal LMA, 0.4% by the Fast track LMA, whereas 75.2% had an endotracheal tube inserted. In 8.3% cases, other methods (tracheostomy or mask ventilation) were used to maintain the patient's airway.

Discussion

Mask ventilation is the primary airway technique enabling lung ventilation before the insertion of any airway device in a patient with insufficient respiration. It is the most basic but often the most important technique for airway management; indeed, difficulties or failures in airway management most frequently cause morbidity and mortality linked to anaesthesia (7).

In the literature, the incidence of DMV is observed to vary between 0.07% and 16% (3,5, 8–10,13-15). In our study, the frequency of DMV (i.e. DMV Grade 3) was 12.6%. The reasons for variation in DMV among studies include the fact that no standardised protocol exists for DMV cases, different age groups of patients are studied, and the personal skills of the researchers and the subjective criteria used to define DMV differ. In our study, we used the DMV scale of Han et al. (6). Although this scale is not widely used in mask ventilation studies, it was selected here because it is easily understood, quick and practical to use.

Many different age groups have been studied in the research regarding the incidence and causes of DMV. Yildiz et al. (14) studied 576 patients aged 18–65 years, and excluded patients>65 years. Of these patients, those with easy mask ventilation had an average age of 42±16 years, those with moderately DMV were aged 50±15 years and those with DMV were aged 48±12 years. Rose et al. (8) investigated all age groups, as observed in the study by Asai et al. (9) (even infants aged<1 years), whereas El-Orbany et al. (15) studied all age groups>18 years. In a study conducted by Racine et al. (5), the average age of the patients was 71±11 years, the range of patients being 60–82 years. In contrast to these studies, we investigated only individuals aged ≥65 years.

A study of the data on 3 years of anaesthesia records from 37 centres in Denmark found that DMV was observed unexpectedly in 808 of 857 cases (94%), but when DMV was expected (218 cases), it was observed in only 49 (22%) cases (10). Based on this study, an estimate of the accuracy of the prediction of airway management by anaesthesiologists in routine practice was published.

In our study a total of 254 patients were investigated and grade 4 DMV was not encountered. A study by Kheterpal et al. (3) on 22,660 patients found the rate of grade 4 DMV was 0.16% (n=37), while another study by the same researcher identified the rate of grade 4 DMV as 0.15% (n=77) in 53,041 patients given mask ventilation (16). In a study of 576 patients by Yıldız et al. (14) they stated they did not encounter grade 4 DMV. When the literature is examined, these studies were completed on very broad patient series and we see the rate of grade 4 DMV is very low.

Physical characteristics of patients such as gender, BMI, mouth opening, thyromental distance that have some effect on difficult mask ventilation. In our study we did not identify a statistically significant relationship between BMI and difficult mask ventilation. As body mass index> 30 kg/m^2 (3) is reported as a risk factor for difficult mask ventilation, BMI> 26 kg/m^2 (13) may be an independent risk factor for difficult mask ventilation. In our study the mean BMI was 26.8 kg/m^2, however the lower number of patients compared to the other two studies may have caused this result.

Our data indicated DMV is significantly higher in male than female patients; this finding is consistent with those of



other studies. For example, Yildiz et al. (14) and Kheterpal et al. (16) found that the male gender was an independent risk factor for DMV and impossible mask ventilation, respectively. In theory, the differences in bone structure, soft tissue and fat deposition in males compared with females creates a tendency for upper airway collapse in males. Similarly, the activation or control of pharyngeal dilator muscles in males can lead to pharyngeal collapse. The difference in respiratory control mechanisms between the genders is also used to explain why male patients are prone to obstructive sleep apnoea syndrome (17). In several studies of DMV, oropharyngeal disproportion, sleep apnoea syndrome and male gender were among the causes of airway collapse (3,10,13). Thus, being male appears to be a predisposing factor for airway collapse, which can increase the difficulty of mask ventilation.

We found that the presence of beards among Grade 3 DMV patients was significantly higher than that in Grade 1 DMV patients, which suggests that beards are a contributing factor to DMV patients. Previous studies have also found that beards were an independent risk factor for DMV in male patients (3,10,13). Long and thick beards or moustaches prevent the mask from fully fitting on the face, resulting in gas leaks.

In our study we did not identify a statistically significant relationship between DMV and thyromental distance and sternomental distance. However, Kheterpal et al. (3) found that thyromental distance of less than 6 cm was an independent risk factor for grade 4 difficult mask ventilation. In our study the fact that the thyromental distance of patients was not low (mean 10 cm) is one of the reasons for not finding it a determining factor for DMV.

With an aging population a prevalence of edentulous patients increased above 60 % among individuals aged ≥65 yr (18). Face mask ventilation of these edentulous patients is often difficult because of the inadequate fitting of the standard mask to the face (19). In addition, because of a reduction in muscle tone under general anesthesia, the air space in the oropharynx is reduced, and posterior displacement of the tongue, soft palate and epiglottis tend to close the airway (20). In old patients with no teeth, sunken cheeks may make ventilation with a mask ineffective; perhaps even impossible (21). In a study of 300 toothless patients, Racine et al. (5) observed 16% DMV. In our study, the 12.6% rate of DMV comprised patients with and without teeth; therefore, the presence of patients with teeth may have reduced the relative incidence of DMV in our study. We found no link between lack of teeth and mask ventilation; however, other studies have shown that mask ventilation is more difficult in toothless patients. For example, in those aged>65 years, lack of teeth, as well as reduced tissue elasticity and muscle tonus, may result in insufficient and ineffective mask ventilation (11). In addition, because the mask does not always fit correctly on the cheeks of toothless patients, severe air leaks may occur. A study by Conlon et al. (12) found that the frequency of toothlessness was 60% in patients aged ≥65 years, which is higher than that in other age groups. Langeron et al. (13) reported that toothlessness was an independent risk factor for DMV.

In our study, we found a strong relationship between the thickness of a patient's neck circumference and DMV. The neck circumference of the patients with Grade 2 and 3 DMV was greater than that of patients with Grade 1 DMV, and as the neck circumference increased, mask ventilation became more difficult. In a study on radiation therapy in the neck region, Kheterpal et al. (16) found that the neck circumference was an independent risk factor for impossible mask ventilation. Similar to our study, Khan et al. (21) also identified a relationship between the neck circumference and DMV. Nafiu et al. (23) found a clear relationship between loud snoring, abdominal obesity, sleep apnoea syndrome and bronchial asthma in patients with greater neck circumference, and observed that children with greater neck circumference had higher Mallampati scores, more DMV particularly after anaesthesia induction and exhibited upper airway obstruction in the postoperative care unit. In our study, the frequency of upper airway obstruction increased in the patients with thicker necks, and we suggest that this made mask ventilation more difficult. In contrast, we found no significant relationship between neck movement and DMVs; however, the evaluation of the patients' neck movement was somewhat subjective and this may have affected this result.

In this study, we observed a significant difference in the experience of the anaesthesiologist ventilating Grade 1 and Grade 2 DMV patients. In particular, anaesthesiologist with an average of 4 years' experience ventilated patients with Grade 1 DMV, whereas those that ventilated Grade 2 DMV patients had an average of 3 years' experience. Therefore, we suggest that as the experience of the anaesthesiologist increases, the rate of easy mask ventilation also increases. We consider that the higher-than-expected number of patients in the Grade 2 DMV group is linked to a reduction in effective mask ventilation performed by less experienced anaesthesiologist.

In our study, DMV was unaffected by the use of opioid agents during anaesthesia; however, in the previous studies, a high dose of opioid agents has been linked to DMV (24-26). Anaesthesiologist has decided the opioid doses in our study

because of DMV incidans may lesser. To compare the effect of opioids on DMV, it would be necessary to use a standardised dose. We also found no significant relationship between the use of neuromuscular blocking agents during anaesthetic induction and DMV. Similarly, Godwin et al. (26) showed that the use of neuromuscular blocking agents in patients with normal airways did not affect mask ventilation. However Warters et al have reported (27) neuromuscular blockade facilitates mask ventilation. They have discussed the implications of this finding for unexpected difficult airway management and for the practice of confirming adequate mask ventilation before the administration of neuromuscular blockade. Their data showed that these medications have significant effects to ease mask ventilation with neuromuscular blockage in practical management of difficult or impossible mask ventilation.

Ikeda et al. (28) investigated the systematic effects of muscle relaxants on mask ventilation during anaesthesia administration with normal upper airway anatomy protecting the neutral head and mandibular position in supine pose. Their hypothesis was that muscle relaxants improve adequate mask ventilation in anesthetized subjects. They have found that rocuronium administration did not change adequate mask ventilation efficacy, and succinylcholine administration improved adequate mask ventilation by 30% in association with pharyngeal fasciculation.

This study has some limitations. Firstly, the subjective evaluation of the patients' neck movement, and lack of a clear measurement for this factor, is an issue. We acknowledge that assessing neck movements using objective criteria would have provided results that were more appropriate. Secondly the duration of mask ventilation was not recorded. Thirdly the doses of opioids and neuromuscular blocking agents used during mask ventilation were not recorded. In addition, the 254 patients assessed in this study represent a rather small population. A larger patient population would enable the collection of additional data that could be considered more reliable. No patient for whom fast-track LMA was used had LMA inserted due to a difficult airway but rather for educational purposes.

Sufficient mask ventilation is the most basic and important skill not just in anaesthesia induction but for reliable airway management during successful resuscitation. As a result knowing the risk factors for DMV in patients with planned elective operations and reliable mask ventilation management may be useful. Our results suggest male gender, thick neck circumference, the presence of beards in male patients and the experience of the anaesthesiologist were all identified as independent risk factors for DMV in intraoperative setting.

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Case Report

DYSPHAGIA: AN INFREQUENT SYMPTOM OF DIFFUSE IDIOPATHIC SKELETAL HYPEROSTOSIS

Abstract

Diffuse idiopathic skeletal hyperostosis (DISH) is a disorder of unknown aetiology characterised by exuberant hyperostosis of the spinal column, that occasionally leads to bone ankylosis and ossification of extra-spinal entheses. Associations with systemic conditions including obesity, hypertension, diabetes mellitus, hyperinsulinaemia, dyslipidaemia and hyperuricaemia have been reported. The thoracic spine is typically involved in DISH followed by thoracolumbar and cervical involvement. Herein, we present a 63-year-old woman with cervicothoracic spine involvement leading to pharyngeal impingement and dysphagia. Clinicians should be aware of this rare clinical manifestation of DISH of the cervical spine and patients should be informed about and followed up for dysphagia.

Key Words: Dysphagia; Cervical Spine; Diffuse Idiopathic Skeletal Hyperostosis.

Olgu Sunumu

DİSFAJİ: DİFÜZ YAYGIN İDİYOPATİK İSKELET HİPEROSTOZİS SENDROMUNDA GÖRÜLEN BİR SEMPTOM

Öz

Yaygın İdiopatik İskelet Hiperostozu (DISH) omurganın aşırı hiperostozisi ile karakterize olup; bazen kemiklerde ankiloz ve ekstra-spinal entezis bölgelerinde ossifikasyonlara yol açan, etyolojisi bilinmeyen bir hastalıktır. Obezite, hipertansiyon, diabetes mellitus, hiperinsülinemi, dislipidemi ve hiperürisemi gibi sistemik hastalıklarla ilişkisi bildirilmiştir. DISH sendromunda tipik olarak torakal omurga tutulumu görülür ve bunu torokolomber ve servikal tutulum takip eder. Bu yazıda, farenkse bası ve yutma güçlüğüne neden olan servikotorasik omurga tutuluma sahip 63 yaşında bir kadın hasta sunuldu. Hekimler servikal tutulumla giden DISH sendromunun bu nadir görülen klinik belirtisinin farkında olmalı ve hastalar yutma güçlüğü açısından bilgilendirilip takip edilmelidirler.

Anahtar Sözcükler: Diffüz İdiopatik İskelet Hiperostozu; Disfaji; Servikal Omurga.

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Introduction

Diffuse idiopathic skeletal hyperostosis (DISH), also known as Forestier's disease (1) is characterized by flowing calcification along the sides of the contiguous vertebrae of the spine. While the aetiology remains unknown, associations with some systemic conditions and comorbidities including obesity, hypertension, diabetes mellitus, hyperinsulinaemia, dyslipidaemia, hyperuricaemia, environmental factors (fluoride), diet and drugs (isotretinoin, acitretin) and metabolic conditions (elevated levels of insulin, insulin-like growth factor-1 and growth hormone, obesity, hyperlipidaemia, hyperuricaemia) have been hypothesised (1–4). Although the exact prevalence and incidence remains unclear, incidence increases with age (5). The thoracic spine is typically and almost always involved followed by thoracolumbar and cervical involvement. DISH is a slowly progressive disorder and might lead to pain and limitation in the affected part of the spine. Some subjects are asymptomatic and are diagnosed incidentally with the observation of ossifications on radiograms obtained for other medical reasons. Due to cervical involvement dysphagia can occur and the incidence varies between 17% and 28% (6). Giant spurs and calcifications in the cervical region may cause dyphagia and airway obstruction. In this report, we discuss a 63-year-old woman with cervicothoracic DISH resulting in dysphagia along with a literature review.

Case

We report a 63-year-old overweight woman admitted to the outpatient clinic with the complaint of neck pain referring to her shoulders and bilateral hand numbness. Past medical history was unremarkable except for type 2 diabetes mellitus which was diagnosed 20 years ago. She was being administered oral antidiabetic drugs and no other medications. On physical examination, cervical range of motion (ROM) was severely limited and painful in all directions. Neurologic examination revealed hypoactive deep tendon reflexes with grade +4/5 power in the upper extremities. Lower extremity muscle power was 5/5 bilaterally with flexor plantar responses. Sensory examination revealed no abnormalities except bilateral hypoaesthesia in the median nerve territory which was prominent on the right side. Electrophysiological evaluation revealed bilateral carpal tunnel syndrome (CTS) of moderate degree on the right and mild degree on the left side. Laboratory tests including whole blood count, C-reactive protein and erythrocyte sedimentation rate were normal except fasting glucose level (175 mg/dl) and HbA1c=10.9 (normal range=4.0–6.3). She was referred to the endocrinology clinic for the management of blood glucose.

Cervical anteroposterior and lateral spine radiographs revealed the characteristic flowing ossification of DISH along the right anterolateral aspect of the cervical vertebrae from C2–C7 (Figure 1). Similarly, anteroposterior and lateral radi-

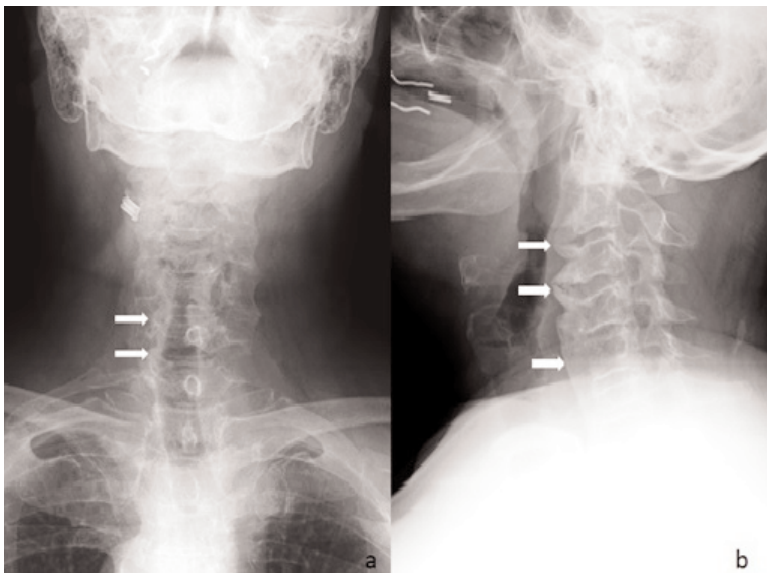


Figure 1— a. Anteroposterior and **b** lateral radiographs of cervical spine show characteristic flowing ossification along the right anterolateral aspect of the cervical vertebrae from C2–C7 (arrows).

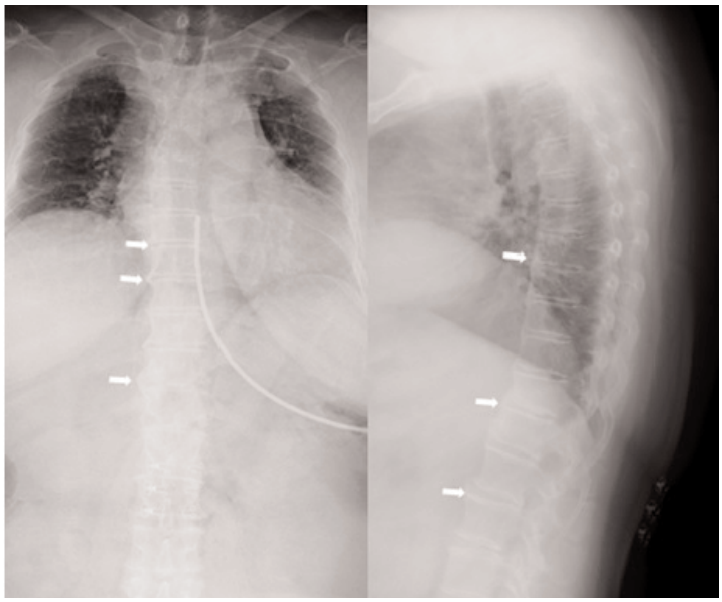


Figure 2— AP and lateral views of thoracic spine show the characteristic flowing osteophytes in the right anterolateral aspect (arrows).

ographs of the thoracic spine also showed characteristic flowing osteophyte formation on the right anterolateral side of thoracic vertebrae (Figure 2).

Upon questioning, the patient reported difficulty swallowing and a foreign body sensation in her throat. She admitted that she had never related the difficulty in swallowing with the neck pain, and therefore, did not bring it up previously. She was informed about the giant osteophytes in the cervical region which might be the cause of her symptoms. Cervical non-enhanced computed tomography (CT) was performed for a detailed assessment of possible pharyngo-oesophageal involvement. Sagittal reconstruction of CT scans demonstrated hyperostosis and anterior cervical fusion from C2–C7 and axial CT imaging demonstrated the pharyngeal compression due to right anterolateral osteophyte formation (Figure 3).

Nonsteroidal anti-inflammatory (NSAID) medication was prescribed together with physiotherapy and an exercise program. Bilateral hand-wrist splints were recommended for the CTS. Neck pain and limitation in cervical ROM improved at the end of a three weeks physical therapy and rehabilitation programme. She was advised to continue with the cervical ROM and strengthening exercises and to adhere to a diabetic diet. She is still on regular follow-ups.

Discussion

Diffuse idiopathic skeletal hyperostosis is shown to be related to systemic conditions and metabolic syndrome (3–5). Our patient was also diabetic and overweight. While decreased range of spinal motion especially a notable loss of thoracic lateral flexion is the most common finding on physical examination, exuberant calcification of ligament as well as spurs could impinge on other structures such as the oesophagus and the larynx, leading to swallowing deficits or dysphonia (7–11). Our patient did not mention swallowing difficulty as a symptom initially. She was questioned about dysphagia after the radiological evaluation which revealed DISH. Dysphagia is a common presenting complaint in otolaryngology practice (12). Hoarseness, stridor, aspiration pneumonia, sleep apnoea, atlantoaxial subluxation or pseudoarthrosis and thoracic outlet syndrome can also be caused by cervical involvement (8,9,13). The risk of vertebral fractures increases with the number of ankylosed vertebra (14).

The most commonly used classification criteria for DISH were defined by Resnick and Niwayama and required flowing anterolateral ossifications of at least four contiguous thoracic vertebral segments, preservation of the intervertebral disk spaces and absence of apophyseal joint degeneration or sacro-

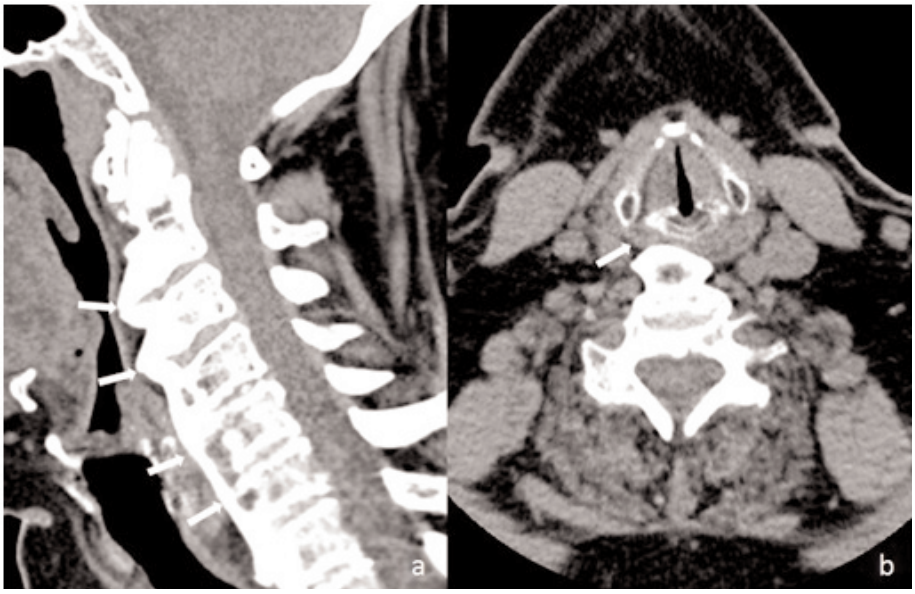


Figure 3— a. Sagittal reconstruction of CT scan demonstrates hyperostosis and anterior cervical fusion from C2–C7 (arrows) **b.** axial CT image shows the pharyngeal compression due to right anterolateral osteophyte (arrow).

iliac inflammatory changes (15). Compared with the thoracic or lumbar spine, alterations in the cervical spine are less frequently encountered (15). Radiographic evaluation of the spine, particularly the thoracic spine, should be obtained to confirm diagnosis among patients with cervical involvement and suspected DISH. Radiographically, the diagnostic criteria of DISH are flowing calcifications and ossifications along the anterolateral aspect of at least four contiguous vertebral bodies. Disk height is usually preserved and excessive disk disease is absent in the involved areas (15). Thoracic and lumbar spine radiography is usually sufficient for the diagnosis of DISH. CT imaging may be performed to evaluate other complications such as pressure symptoms on adjacent organs or fractures.

Conservative treatment of DISH includes physical therapy, exercises, analgesics, NSAIDs and muscle relaxants (5). Occasionally, dysphagia due to esophageal compression may require surgery. When the osteophytes are remarkably large surgery may be needed. (16). For patients who fail conservative treatment, surgical decompression through osteophytectomy is also an effective option (17). Our patient had mild dysphagia which had not yet affected her nutritional status, but she was informed about the possible worsening of symptoms.

This report serves to increase awareness of DISH especially in patients with metabolic syndrome having spinal pain, diminished ROM and stiffness. Besides these well known symptoms of DISH, dysphagia may be the presenting symptom. Clinicians should be aware of dysphagia as a symptom of DISH. They should question and counsel patients about difficulty swallowing and follow them up for possible rare complications such as dyspnoea and undernutrition which require surgical intervention.

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Case Report

CONJUNCTIVITIS AS A RARE SIDE-EFFECT OF RISEDRONATE: A CASE REPORT

Abstract

Osteoporosis is common metabolic bone disease in older people. Bisphosphonates is usually used in the management of osteoporosis. However, a small number of patients have been recognized to develop ocular inflammation due to administration of bisphosphonates. We report the case of risedronate-induced conjunctivitis in a 68-year-old woman. This was successfully treated with stopping risedronate. Applying Naranjo's adverse drug reaction probability scale, a causality assessment was made which categorized this reaction as probable with a score of 7. This case report reviews the literature on the ocular effects of risedronate and discusses a possible mechanism for the association. Although ocular adverse effects of bisphosphonates are rare, it may effect eyesight. Physical Medicine and Rehabilitation clinicians should be aware of ocular side-effects in older patients because a delay in diagnosis may result in serious adverse outcomes.

Key Words: Aged; Osteoporosis; Risedronate; Conjunctivitis.

Olgu Sunumu

RİSEDRONATA BAĞLI GELİŞEN NADİR BİR YAN ETKİ; KONJUNKTİVİT: OLGU SUNUMU

Öz

Osteoporoz yaşlılarda sık karşımıza çıkan metabolik bir kemik hastalığıdır. Osteoporoz tedavisinde genellikle bifosfanatlar kullanılır. Bununla birlikte, bifosfanat grubu ilaçların az sayıda hastada gözde inflamasyon bulgularına neden olduğu bildirilmiştir. Bu çalışmada risedronat kullanımının neden olduğu konjunktuvit tablosuyla gelen ve risedronatın kesilmesi konjunktivit semptomlarının gerilediği 68 yaşında bayan hastayı sunduk. Naranjo'nun ilaç yan etki olasılığı ölçeğine göre 7 puan alan hastamız, kuvvetle muhtemel kategorisine uymakta idi. Bu olgu sunumu aracılığıyla bifosfanat grubu ilaçların göz üzerine olan yan etkilerini hatırlatmayı ve olası etki mekanizmasını tartışmayı amaçladık. Bifosfanatların göz üzerine olan yan etkileri nadir olmasına rağmen, görme bozukluklarına neden olabilir. Fiziksel tıp ve rehabilitasyon hekimleri yaşlı hasta popülasyonunda bu yan etkiler açısından dikkatli olmalıdır; gecikmiş tanı görme kayıplarına neden olabilir.

Anahtar Sözcükler: Yaşlı; Osteoporoz; Risedronat; Konjunktivit.

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Introduction

Bisphosphonates (BPs) are frequently used for the prevention and/or treatment of osteoporosis (1). They are divided into two groups: nitrogen and non-nitrogen. The nitrogen group includes pamidronate, alendronate, risedronate, ibandronate, and zoledronic acid, while the non-nitrogen group includes etidronate and clodronate (2). Risedronate, a nitrogen BPs, modulates bone metabolism at the cellular level by inhibiting farnesyl diphosphate synthetase and inducing osteoclast apoptosis (3).

Bisphosphonates are well tolerated in general; however, they can occasionally cause side-effects. Most common side-effects include nausea, dyspepsia, abdominal pain, and myalgia (1). Ocular side-effects are rare, but can be serious. Occurrences of conjunctivitis, uveitis, scleritis, episcleritis, optic or retrobulbar neuritis, cranial nerve palsy, and ptosis have been previously reported (4). Ocular side-effects have been associated with the use of both nitrogen (i.e., pamidronate, alendronate, zoledronate, and risedronate) and non-nitrogen groups (i.e., etidronate) (2). For risedronate, scleritis, episcleritis, and ocular myasthenia gravis each have been reported only once, and three cases of conjunctivitis associated with its use have been described (5-7).

Here we report the case of risedronate-induced conjunctivitis in a 68-year-old woman. To the best of our knowledge, this is the fourth case report on risedronate-induced conjunctivitis treated with fusidic acid and discontinuation of risedronate.

Case

A 68-year-old woman with back pain was admitted to our Physical Medicine and Rehabilitation (PMR) outpatient clinic. Her pain began six months prior. Although she did not report morning stiffness or pain at night, she explained that her pain increased with exercise and decreased with rest.She visited a different PMR clinic six months prior for a rehabilitation program; however, her pain continued. Although she had been diagnosed with osteoporosis in 2006 based on her bone mineral density findings [T scores were -2.6 and -2.5 standard deviations (SDs) for the lumbar region (L1–L4) and femoral neck, respectively], she was not under any medication for osteoporosis on admission. On physical examination, it was revealed that the spinal processes in the lower thoracic and lumbar vertebrae were painless to palpation. The lumbar range of motion was painful in all directions. Plain radiographs of the dorsal (anterior–posterior and lateral) region revealed height loss in the dorsal vertebrae and degenerative changes. Her bone mineral density examination revealed T scores of -3.5 and -3.4 SDs for the lumbar region (L1–L4) and femoral neck, respectively. Laboratory investigation revealed normal values for blood cell counts and normal serum levels of calcium, phosphorus, parathyroid hormones, alkaline phosphatase, and 25-OH-vitamin D3.

Treatment with risedronate (150 mg/month), calcium (1 g/day), and vitamin D (880 IU/day) supplementation was initiated. Six hours after the first oral administration of risedronate, she developed right conjunctival hyperemia, photophobia, and pain (Figure 1). Her vision was not affected, and there was no mucopurulent secretion from the eyes. An ophthalmologist was consulted, and she was diagnosed with conjunctivitis as a risedronate-induced side-effect. Applying Naranjo's adverse drug reaction probability scale, a causality assessment was made, which categorized this reaction as probable with a score of 7. Therefore, risedronate administration was stopped and topical fusidic acid administration was initiated by the ophthalmologist. Because the conjunctivitis was considered to be a risedronate-induced side-effect, the ophthalmologist emphasized that fusidic acid should be used for prophylaxis of future bacterial infections. Two weeks after discontinuing risedronate and using fusidic acid, her eye symptoms disappeared.

Discussion

Bisphosphonates have been widely used to treat various diseases, including osteoporosis, bone metastasis, Paget's disease, hypercalcemia, and other conditions associated with bone resorption (1,2). In addition, an anti-tumor effect from

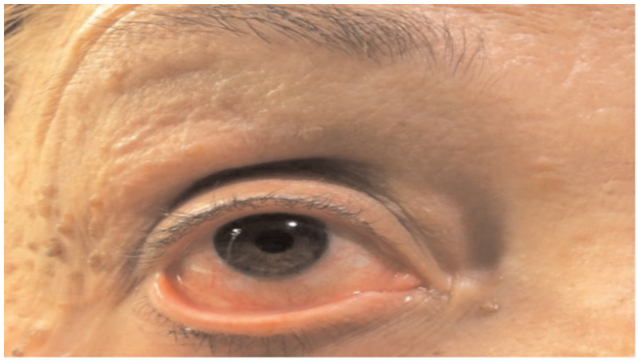


Figure 1— Conjunctival hyperemia on the right eye.



these medications has been observed in patients with cancer without metastasis in recent years (9). Based on these findings, it is probable that BPs usage will increase in the future as well. The most common side-effects of BPs include nausea, dyspepsia, abdominal pain, myalgia (2). Cases of ocular side-effects in individuals taking BPs have been reported since 1993; the first report for risedronate was published in 2002 by Vinas *et al*. (9). However, ocular side effects with this class of medication are uncommon with an estimated incidence around 0.05% (5,10). The cases included occurrences of conjunctivitis, uveitis, scleritis, optic or retrobulbar neuritis, and cranial nerve palsy (2,11).

The exact mechanisms underlying the ocular side-effects attributable to BPs remain unclear.

Ocular inflammation may be caused by the localized manifestations of a systemic adverse reaction to a drug. BP-induced ocular inflammation has also been associated with systemic acute-phase reactions, such as fever and influenza-like symptoms. BPs are associated with human T-cells that are key players in the interface between innate and adaptive immunity (12). BPs stimulate the production of a distinct subgroup of T-cells that constrain bone resorption. As a synthetic analogue of inorganic pyrophosphates, these drugs share several homologies with non-peptide gamma–delta T-cell ligands that activate the gamma–delta T-cell antigen receptors; this activation releases cytokines and inflammatory mediators (7,12,13). Therefore, BPs induce immunologic or toxic reactions, resulting in the release of inflammatory cytokines such as tumor necrosis factor-·, interleukin-6, and other cytokines. Although, in recent literature, ocular inflammation has been postulated as a localized manifestation of a systemic adverse reaction to the drug (1), the reason why the eye has been a target organ remains unknown (2,6,13,14).

In recent studies, there have been no underlying diseases associated with BP-induced ocular inflammation; therefore, the predisposing factors for this inflammation have not yet been elucidated (10). Some authors have indicated that ocular inflammation can also be a sign of systemic rheumatic disease, but most of these affected patients had no underlying conditions (10). In inflammatory ocular diseases that are associated with rheumatic diseases such as systemic lupus erythematosus and rheumatoid arthritis, IL-6, an inflammatory cytokine, has been responsible for causing ocular inflammatory reactions similar to those with BPs. IL-8 also contributes to ocular and orbital inflammation by promoting neutrophil and T-cell recruitment to the eye (15). It is unclear whether the ocular side-effects attributable to BPs are a direct side-effect or an effect associated with underlying disease, particularly rheumatic disease (2). Furthermore, although patients who have rheumatic disease may require treatment with steroids, BPs may be used to prevent corticosteroid-induced osteoporosis or rheumatic disease-induced osteoporosis. For example, Pazianas *et al.* showed increased ocular side-effects related to BPs in rheumatic disease; this study revealed that one in five patients treated with alendronate had known rheumatic disease and one in 20 had been treated with topical eye steroids in the past year (2). Thus, further studies are needed to reveal the exact mechanism for inflammation in rheumatic diseases and also that with BP usage. In the present case, there were no positive rheumatic assessment findings.

Risedronate-related ocular side-effects have infrequently been presented in the literature and based on our literature search, we found that ocular side effects can have a relatively rapid onset (within a few hours of administration) or can appear as long as six years after the administration of the drug (2,17). Three weeks has been reported as the average time to the onset (2). Barrera *et al*. published the results of an observational study of 13,164 risedronate-treated patients in England and detected 19 adverse events, including three case of conjunctivitis and one case of episcleritis. They described conjunctivitis as a side-effect of risedronate on days 14, 29, and 100 of administration (3). Hemmati *et al*. described risedronate-associated scleritis (7). In this case, the symptoms started on the day risedronate was started. After reviewing the patient's detailed medical history, the authors found that there were similar eye symptoms two years prior while using a smaller dosage of risedronate. Similar to the Hemmati *et al* case, Geneva *et al* presented two cases of conjunctival squamous metaplasia that were related to risedronate sodium. The detailed medical histories for these patients revealed previous use of risedronate. However, unlike the previous cases, one patient had been treated with risedronate for six years. The authors explained that the possible mechanism was ocular inflammation, similar to that in BP-induced conjunctivitis (17). Table 1 summarizes the ocular findings of the reported cases from the literature that were associated with risedronate therapy. It is important to consider BP-induced ocular side effects in the medical history. In the current report, we describe the occurrence of risedronate-induced conjunctivitis in a 68-year-old woman, which occurred 6 h after the first oral administration of risedronate. Applying Naranjo's adverse drug reaction probability scale, a causality assessment was made, which categorized this reaction as probable with a score of 7 (18). BP-induced conjunctivitis or episcleritis usually has a good prognosis, and the symptoms generally resolve without

specific treatment. Non-steroidal anti-inflammatory eye drops often can resolve the symptoms as well (10). To the best of our knowledge, this is the fourth case of risedronate-related conjunctivitis. In this case, discontinuing risedronate treatment and initiating prophylactic treatment with fusidic acid to prevent future infections resulted in an improvement in two weeks.

In conclusion, osteoporosis is common in older people. BPs are prescribed for the prevention and treatment of osteoporosis. Although rare, it is important to consider BP-induced ocular adverse effects. With the increasing use of BPs, PMR clinicians and rheumatologists should be aware of the possibility for rare ocular side-effects of BPs and should obtain a detailed drug history. A delay in diagnosis can allow the development of contralateral eye involvement or recurrent and chronic inflammation that may result in adverse visual outcomes.

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Case Report

ISOLATED LEFT HAND WEAKNESS DUE TO CORTICAL INFARCTION

Abstract

Isolated pure motor weakness of a hand or particular group of fingers usually results from a peripheral neurological disease, although, rarely, it can be caused by central neurological disease, such as cortical infarcts. Weakness of a hand or a particular group of fingers due to cortical cerebral infarction has been described as "pseudo-peripheral palsy." The motor representation of the hand in the brain is localized to a knob-like structure in the precentral gyrus. A lesion localized in a region of the hand knob could affect all the muscles of the hand or the muscles innervated by the radial, median, and ulnar nerves. Infarctions in the parietal lobe or white matter of the angular gyrus, postcentral gyrus, ventroposterior thalamus, corona radiate, basal ganglia, and posterior limb of the internal capsule can also mimic peripheral nerve lesions. In patients with monoparesis caused by stroke, cerebral computed tomography can miss infarct lesions. Using magnetic resonance imaging can allow the identification of small vascular lesions that cause monoparesis. Early diagnosis of "pseudo-peripheral palsy" is important for adopting a suitable therapeutic approach to prevent a recurrent or larger cortical infarction. We describe 65-year-old patient who presented with an acute paresis of her left hand, suggesting a peripheral nerve lesion. However, on clinical examination, a peripheral origin could not be veri?ed, prompting further investigation. Di?usion-weighted magnetic resonance imaging revealed an acute hemorrhagic lesion. The peripheral nerve pattern of lesions caused by cortical infarcts should be taken into consideration in the differential diagnosis of isolated hand monoparesis.

Key Words: Aged; Monoparesis; Hand.

Olgu Sunumu

KORTİKAL İNFARKTA BAĞLI OLARAK GELİŞEN İZOLE SOL ELDE GÜÇSÜZLÜĞÜ

Öz

El veya parmakların izole saf motor güçsüzlüğü genellikle periferik sinir sistemi hastalıklarına bağlı olarak gelişmesine rağmen nadiren kortikal infarktlar gibi santral sinir sistemi hastalıklarına bağlı oluşabilmektedir. El veya parmakların kortikal serebral infarkta bağlı güçsüzlüğüne ' psödoperiferal palsi' denir. Elin motor temsili presantral girusta bir kabartı şeklindedir. Bu bölgedeki lezyonlar tüm el kaslarını veya radiyal, ulnar ve median sinirin innerve ettiği kasları etkiler. Ayrıca pariyetal lob, angular girus beyaz madde, postsantral girus, ventroposterior thalamus, korona radiate, bazal ganglia, internal kapsülün arka boynuzundaki lezyonlar da periferik sinir lezyonlarını taklit eder. İnmeye bağlı monoparezide Beyin Tomografisi infarkt alanını göstermede yetersiz kalır. Magnetik rezonans görüntüleme küçük vasküler lezyonların neden olduğu infarkların görüntülenmesini sağlar. 'Psödoperiferal palsi' tanısının erken evrelerde konması uygun terapötik yaklaşım ile kortikal infarktın büyümesini ve tekrarlamasını önler. Biz bu olgu sunumunda aracılığıyla periferik sinir lezyonunu taklit eden akut sol el parezisi olan 65 yaşındaki hastayı sunduk. Klinik muayene ve bulgular neticesinde periferik sinir lezyonu tespit edilememesi nedeni ile tetkik edilen olgunun magnetik rezonans görüntülemesinde akut hemorajik lezyonu tespit ettik. Bu olgu sunumu aracılığı ile izole el monoparezinin ayrıcı tanısında santral sinir sistemi hastalılarının da akılda tutulması gerektiğini hatırlatmayı amaçladık.

Anahtar Sözcükler: Yaşlı; Monoparezi; El.

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Introduction

Isolated pure motor weakness of the hand or a particular group of fingers can be the result of a peripheral or central neurological disease (1). Focal hand weakness can be related to peripheral neurological diseases and, in rare cases, central neurological diseases, such as cortical infarcts, can cause isolated hand weakness (2). Weakness of a hand or a particular group of fingers due to cortical cerebral infarction was first described by Lhermitte in early 1900s and called "pseudo-peripheral palsy" (3). This can mimic ulnar, radial, or median nerve palsy (4).

The motor representation of the hand in the brain is localized to a knob-like structure in the precentral gyrus shaped like an omega or epsilon in the axial plane and a hook in the sagittal plane. "Pseudo-peripheral palsy" is usually caused by cortical infarction within this structure (5). Infarction in the parietal lobe or white matter of the angular gyrus, postcentral gyrus, ventroposterior thalamus, corona radiate, basal ganglia, and posterior limb of the internal capsule also can mimic peripheral nerve lesions (6, 7).

We describe a patient who presented with an acute paresis of her left hand related to acute right hemorrhagic centrum ovale, corona radiate, parietal lobe, and parieto-occipital brain infarction.

Case

A 65-year-old male patient presented to the Physical Medicine and Rehabilitation Department with dificulty in moving the thumb, index, and middle finger of her left hand. He had noticed the symptoms two days earlier. He had not taken alcohol or hypnotics before the event, and she felt no sensory disturbances. He had no history of arterial hypertension or other disease. He had presented at the neurology clinic with the same symptoms one day before, and had undertaken a brain computed tomography (CT) scan that revealed increased third lateral ventricle compartment, increased cortical sulcal length consistent with senile atrophy, right centrum ovale chronic infarct, and periventricular ischemic microangiopathic changes. The neurology clinic transferred the patient to the outpatient clinic. Clinical examination of her left hand revealed a paresis (strength 3–4 on the Medical Research Council scale for muscle strength) of Mm. flexor pollicis, Mm. flexor abductor pollicis brevis, Mm. opponens pollicis, Mm. flexor digitorum superficialis 2–3, and Mm. flexor digitorum profundus 2–3. Ulnar-radial and dorsal wrist flexions and adduction and abduction of fingers II–V were normal. Similarly, proximal arm muscles, somatosensory perception, muscle tone, and tendon reflexes were unaflected. Her bilateral Babinski sign was absent. Further clinical examination, including language function, cranial nerves, and plantar reflex, showed no abnormalities. Electroneuromyography (EMG) was performed. Nerve conduction studies were normal. In the needle EMG, although there was activation deficiency with muscles innervated by C8–T1, acute denervation was not observed. The needle EMG suggested weak chronic C7 radix involvement. Magnetic resonance imaging (MRI) of the cervical spine revealed multiple prolapsed discs at the C3–4 and C4–5 levels, with cord compression at the C3–4 and C5–6 levels. There was also diffuse bulging at the C6–7 level; the cord and radix touched at the same level. Peripheral nerve weakness origin could not be detected, and brain and contrast-enhanced brain MRI scans were performed to look for a central cause. The brain MRI revealed right centrum ovale, corona radiata, parietal lobe, and parieto-occipital brain hyperintense lesions in T1 weighted, T2 weighted, and fluid attenuated inversion recovery (FLAIR) sequences consistent with acute hemorrhagic infarction. The contrast-enhanced brain MRI revealed an acute right sulcal hemorrhagic hyperintense lesion in the T1 sequence and a heterogeneous hyperintense lesion in the T2 sequence in the centrum semiovale, corona radiata, parietal lobe at the precentral-postcentral gyrus level, and parieto-occipital region developed from venous angioma-arteriovenous malformation (Figure 1).

Discussion

Focal and isolated extremity monoparesis is a rare presentation of stroke, often misdiagnosed as peripheral nerve lesion (6, 8). "Pseudo-peripheral palsy" is a term used to describe a rare clinical condition associated with cerebral infarction consisting of weakness of the hand or a particular group of fingers (3). Isolated hand weakness due to cortical infarction has been reported to mimic ulnar, median, and radial nerve entrapment neuropathies (1-8). In the case reported here, the patient's muscle innervated by the median nerve was weakened. Muscle groups innervated by the radial and ulnar nerves were at normal strength. There were no clinical findings of central origin lesions, such as abnormal muscle tone, asymmetric deep tendon reflexes, or extensor Babinski reflex. In differential diagnosis, non-traumatic entrapment neuropathies such as carpal tunnel syndrome and anterior interosseous syndrome were investigated. Peripheral nerve origin hand we-

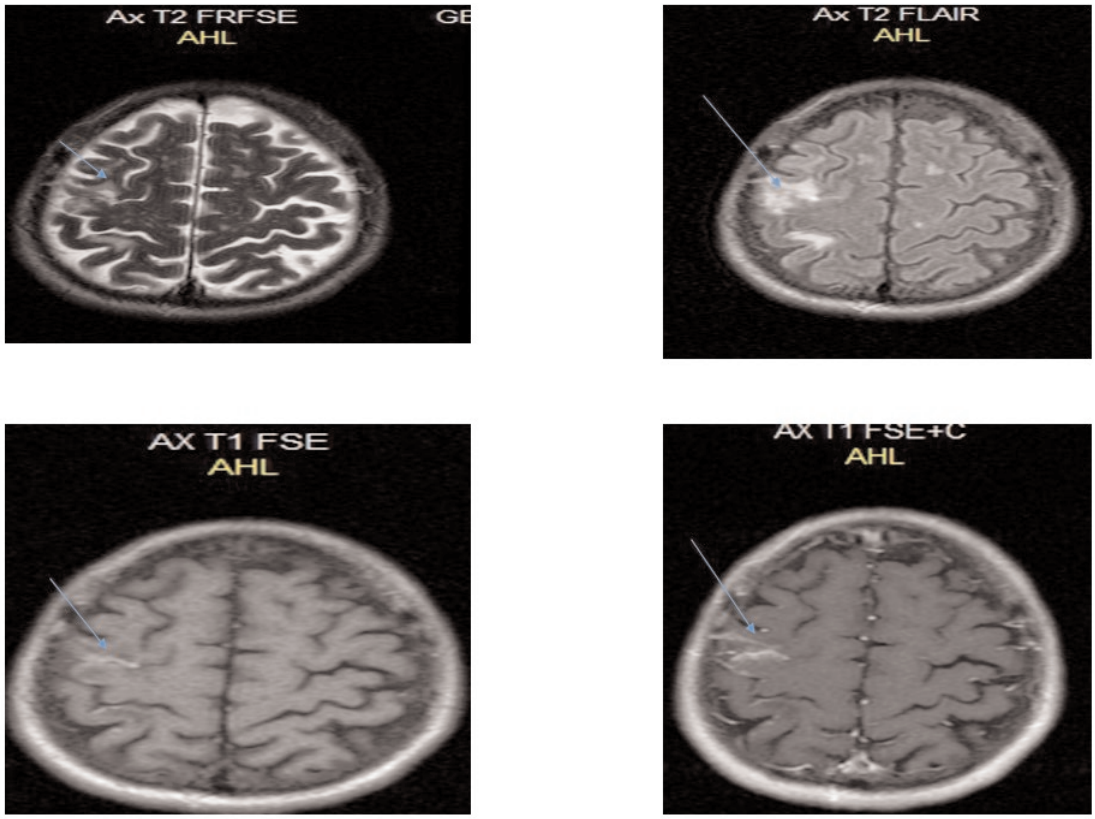


Figure 1— The contrast-enhanced brain MRI shows an acute right sulcal hemorrhagic hyperintense lesion in the T1 sequence and a heterogeneous hyperintense lesion in the T2 squence in the centrum semiovale, corona radiata, parietal lobe at the precentral-poscentral gyrus level, and parieto-occipital region.

akness could not be detected in an EMG but brain MRI revealed acute right hemorrhagic centrum ovale, corona radiata, parietal lobe, and parieto-occipital brain infarction.

The cortical "hand knob" in the precentral gyrus has been referred to as the site of hand motor function, although the control center of hand movement is not limited to this area alone. Infarctions in the parietal lobe are also related to isolated hand motor disorders. In human and animal models it has been shown that the inferior parietal lobe includes somatotopic representation of the hand. Additionally, infarction of the white matter of the angular gyrus, postcentral gyrus, ventroposterior thalamus, corona radiate, basal ganglia, and posterior limb of the internal capsule can cause hand weakness and can mimic peripheral nerve lesions (6, 7). Timsit et al. first reported isolated hand palsy as a parietal lobe syndrome in six patients. In their series, all patients had pure motor pseudoulnar deficits (8). In a recent article by Kim concerning stroke patients with either a predominant radial or an ulnar-sided finger disturbance, infarct localization was in the hand-representation area of the motor cortex (9). Chen et al. presented a case series study with four patients with uniform hand weakness and two patients with radial and ulnar weakness. The lesion localizations were at the hand knob area in five patients and the hand knob area plus the postcentral gyrus in one patient. The two cases with uniform digit weakness had additional involvement of the inferior parietal lobule (10). Çelebisoy et al. described pure motor hand monoparesis in eight patients who had a precentral gyrus lesion (11). Manjaly et al. presented a case of acute paresis of the distal right hand suggesting a peripheral median nerve lesion. The case they described had an acute ischemic lesion in the hand knob area of the motor cortex (12). Ueno et al. presented a case with a small infarct of the left precentral knob area, which induced both motor and sensory impairments that were similar to right ulnar

nerve palsy (13). In the present case, the lesion localization was in the centrum ovale, corona radiate, parietal lobe at precental and postcentral gyrus level, and parieto-occipital brain.

In previous studies of patients with hand monoparesis caused by stroke, cerebral CT showed no lesions in approximately 40% of the patients. According to these studies, CT can miss some small infarcts. Using functional MRI, transcranial magnetic stimulation and fiber tracking studies could identify anatomic localization of lesions causing monoparesis (1,14). In the present case report, although the brain CT conducted by the Neurology Department did not reveal acute hemorrhagic infarction, diffusion and contrast-enhanced MRI revealed a hemorrhagic infarction.

The prognosis of cortical infarcts related to the isolated hand weakness seems to be favorable, with the patients usually recovering (12). Early diagnosis of "pseudo-peripheral palsies" is important for adopting a suitable therapeutic approach for preventing recurrent or larger cortical infarctions.

In conclusion, isolated hand weakness can be due to cortical infarction mimicking peripheral nerve disease. Such cortical infarctions are often misdiagnosed, and, consequently, the opportunities to identify and address stroke risk factors are missed. Early recognition of a small cortical stroke in patients with sudden onset hand weakness can lead to appropriate stroke management.

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