Turkish Journal of Geriatrics
Geriatri 2014, 17/4

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Gönül URALOĞLU, Barın SELÇUK, Aydan KURTARAN, Elif YALÇIN, Murat İNANIR, Ilgın SADE, Müfit AKYÜZ

✓ **Comparison of the Outcomes of Watchful Waiting and Surgery in 80 Years of Age and Older Comorbid and Minimally Symptomatic Inguinal Hernia Patients**
Seksen Yaş Üzeri Komorbid ve Minimal Semptomatik İnguinal Herni Hastalarında Takip ile Operasyon Sonuçlarının Karşılaştırılması
Recep AKTİMUR, Süleyman ÇETİKKÜNAR, Kadir YILDIRIM, Sabri ÖZDAŞ, Sude Hatun AKTİMUR, Elif ÇOLAK, Hakan GÜZEL, Mehmet Derya DEMİRAĞ, Nuraydın ÖZLEM

✓ **Diagnostic Value of Neutrophil/Lymphocyte Ratio in Geriatric Cases with Appendicitis**
Geriatrik Yaş Grubunda Görülen Akut Apandisit Olgularında Nötrofil/Lenfosit Oranının Tanısal Değeri
Erkan YAVUZ, Candaş ERÇETİN, Emin UYSAL, Süleyman SOLAK, Aytaç BİRİCİK, Hakan YİĞİTBAŞ, Osman Bilgin GÜLÇİÇEK, Ali SOLMAZ, Rıza KUTANİŞ

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Mehmet CAVLAK, Aysun ODABAŞI BALSEVEN, Ramazan AKÇAN, Mahmut Şerif YILDIRIM, Aykut LALE, Eyüp Ruşen HEYBET, Ali Rıza TÜMER

✓ **Correlations of Histopathological Features with Axillary Lymph Node Invasion Among Patients with Breast Cancer in Geriatric and Non-Geriatric Populations**
Meme Kanserli Yaşlı ve Genç Hastalarda Histopatolojik Özellikler ve Bunların Koltuk Altı Lenf Bezi Tutulumu ile İlişkisi
Şahin KAHRAMANCA, Oskay KAYA, Hakan GÜZEL, Bülent Çağlar BİLGİN, Tezcan AKIN, Gülay ÖZGEHAN, Bertan KÜÇÜK, Hülagü KARGICI

✓ **Forensic Autopsies of Geriatric Deaths Conducted in Elazig**
Elazığ'da Adli Otopsisi Yapılan Geriatrik Ölümlerin Değerlendirilmesi
Abdurrahim TURKOGLU, Mehmet TOKDEMİR, Turgay BORK, Ferhat Turgut TUNCEZ

✓ **A Comparison Study of Single Dose Versus Continuous Subarachnoid Levobupivacaine for Transurethral Resection**
Transüretral Rezeksiyonda Tek Doz ve Sürekli Subaraknoid Levobupivakain Uygulamasının Karşılatırılması
Şeyda PEZEK AYDIN, Füsun BOZKIRLI

✓ **Investigation of the Effects of Anesthesia Techniques on Intensive Care Admission and Postoperative Mortality in Elderly Patients Undergoing Bilateral Knee Replacement Surgery**
Bilateral Diz Protezi Nedeniyle Opere Olan Yaşlı Hastalarda Anestezi Tekniklerinin Yoğun Bakıma Giriş ve Postoperatif Mortaliteye Etkisinin Retrospektif Olarak İncelenmesi
Elif DOĞAN BAKI, Özal ÖZCAN, Mehmet Ersegün DEMİRBOĞAN, Serdar KOKULU, Hanife UZEL, Yüksel ELA, Remziye Gül SIVACI

✓ **Prevalence and Risk Factors of Urinary Incontinence and Its Impact on Quality of Life Among 65 Years and Over Women Who Lived in Rural Area**
Kırsal Alanda Yaşayan 65 Yaş ve Üzeri Kadınlarda Üriner İnkontinans Görülme Sıklığı, Risk Faktörleri ve Yaşam Kalitesi Üzerine Etkisi
Tuba DEMİREL, Belgin AKIN

✓ **Assessment of Geriatric Patients' Satisfaction on Hearing Aids and Their Influence on Quality of Life**
Geriatrik Hastaların İşitme Cihazı Memnuniyetinin ve Cihazların Yaşam Kalitesine Etkisinin İncelenmesi
Özgül AKIN ŞENKAL, Ayşen KÖSE, Songül AKSOY

✓ **Investigating the Effects of Poverty on Health and Quality of Life in Poor People Aged 65 and Over in Etimesgut District, Ankara**
Ankara Etimesgut İlçesinde Yaşayan 65 Yaş ve Üzeri Yoksul Bireylerde Yoksulluğun Sağlık ve Yaşam Kalitesi Üzerine Etkisinin İncelenmesi
Fikriye YILMAZ, Cansu ÇELİK, Rukiye NUMANOĞLU TEKİN

✓ **Acceptability, Reliability and Validity of the Turkish Version of the De Morton Mobility Index in Elderly Patients with Knee Osteoarthritis**
Diz Osteoartriti olan Yaşlı Hastalarda De Morton Mobilite İndeksi'nin Türkçe Versiyonunun Kabul Edilebilirlik, Geçerlik ve Güvenirliği
Zeliha Özlem YÜRÜK, Aydan AYTAR, Emine Handan TÜZÜN, Levent EKER, İnci YÜKSEL, Natalie A. De MORTON

✓ **How Effective are Exercise Recommendations Supported by Written and Visual Materials in Elderly People?**
Yazılı ve Görsel Materyallerle Desteklenen Egsersiz Önerileri Yaşlı Bireylerde Ne Kadar Etkili?
Fatma BAŞALAN İZ, Emrah ATAY

✓ **Geriatrics and Natural Law: The Missing Link**
Doğal Hukuk ve Geriatri: Gözden Kaçan Bağ
Erdem İlker MUTLU

✓ **Paraplegia in an Elderly Patient Due to Pott's Disease**
Yaşlı Bir Hastada Pott Hastalığına Bağlı Gelişen Parapleji Olgusu
Bahri TEKER, Mehmet AĞIRMAN, Tuğrul ÖRMECİ, Mehmet TEZER, Ali MERT, Engin ÇAKAR

✓ **Hypoglycemia Caused by Ciprofloxacin in a Non-Diabetic Elderly Patient: A Case Report**
Diyabetik Olmayan Yaşlı Bir Hastada Siprofloksasinin Neden Olduğu Hipoglisemi: Bir Vaka Sunumu
Dilek ARPACI, Aysel Gürkan TOÇOĞLU, Bilal Seyyid AÇIKGÖZ, Ali TAMER

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İLETİŞİM *(Correspondance)*
Güneş Kitabevi Ltd. Şti.
M. Rauf İnan Sok. No. 3 06410
Sıhhiye/ANKARA
Tel: (0312) 435 11 91-92
Fax: (0312) 435 84 23
web: http://www.guneskitabevi.com
e-posta: geriatri@guneskitabevi.com

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Turkish Geriatrics Society
www.turkgeriatri.org
info@geriatri.org
www.geriatri.dergisi.org
editor@geriatri.dergisi.org

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Baş Editörden
(From The Editor In Chief)

Turkish Geriatrics Society releases several scientific documents for the public and press releases every year continuously.

The following documents which were prepared during 2014, can be reached from the website of the society (www.turkgeriatri.org):

I. NGOs, including in the Turkish Geriatrics Society met in Istanbul on 9-10 November, 2014. The theme was "Road Safety" and our society offered contributions from the perspective of seniors.

II. The activities of Turkish Geriatrics Society took place in "IAGG Newsletter": Sept 2014, Vol. 20, No.4.

III. "Elderly abuse and neglect" was brought to stage in a document dated; 15th Sept, 2014.

IV. The society organized a public conference on "Dementia, Delirium and Depression" on the 1st of October "International Elderly Day" in Çankaya Municipality-100+ Age Club, Ankara-Turkey. The members of the 100+ age club will were informed about prevention, early diagnosis, differential diagnosis and tretament of these three neurological and psychological diseases that are seen in advanced age. Assoc. Prof. Ufuk Ergün was the presenter and the seniors showed great interest and curiosity to these topics.

V. "Risk factors of ill health among older people", which are; injury, development of noncommunicable diseases, poverty, social isolation and exclusion, mental health disorders and elder maltreatment were discussed in an another document dated: 2nd June, 2014.

VI. May 31 "World No Tobacco Day" 2014 campaign was organized by Specialty Associations Coordination Board of Turkish Medical Association and Turkish Geriatrics Socierty was one of the partners of the press release.

VII. Our Society took actively part in the "National Vaccine Workshops" and the related reports in March 2014.

VIII."Ageing Turkey" report was released in **3.2.2014.**

IX. Education programs of Turkish Geriatrics Society took place in 2014; 1st Course on "Scientific Researches in Geriatrics", "Basic Geriatrics Updating Course" for medical doctors and "Geriatric Nursing Updating Course" for nurses were performed successfully in April 2014. The coming courses will be announced on the web site of the society.

X. Every year in 18-26 March during the "National Elderly Respect Week" our society orhanizes symposiums for public, and the theme of this year was: "Ageing without getting old". Tips for healthy ageing, exercise recommendations for elderly, prevention of falls, rationale grug use, prevention from mouth and teeth problems were given by the academicians.

Prof. Yesim GOKCE KUTSAL, M.D.

Turkish Journal of Geriatrics

Türk Geriatri Dergisi
2014 17/4

İÇİNDEKİLER (CONTENTS)

2014 17/4

ARAŞTIRMALAR (RESEARCHES)

Assessment of the Bowel Dysfunctions in Stroke Patients 331-337

İnmeli Hastalarda Barsak Fonksiyon Bozukluklarının Değerlendirilmesi

Gönül URALOĞLU, Barın SELÇUK, Aydan KURTARAN, Elif YALÇIN, Murat İNANIR Ilgın SADE, Müfit AKYÜZ

Comparison of the Outcomes of Watchful Waiting and Surgery in 80 Years of Age and Older Comorbid and Minimally Symptomatic Inguinal Hernia Patients 338-344

Seksen Yaş Üzeri Komorbid ve Minimal Semptomatik İnguinal Herni Hastalarında Takip ile Operasyon Sonuçlarının Karşılaştırılması

Recep AKTİMUR, Süleyman ÇETİKKÜNAR, Kadir YILDIRIM, Sabri ÖZDAŞ Sude Hatun AKTİMUR, Elif ÇOLAK, Hakan GÜZEL, Mehmet Derya DEMİRAĞ, Nuraydın ÖZLEM

Diagnostic Value of Neutrophil/Lymphocyte Ratio in Geriatric Cases with Appendicitis 345-349

Geriatrik Yaş Grubunda Görülen Akut Apandisit Olgularında Nötrofil/Lenfosit Oranının Tanısal Değeri

Erkan YAVUZ, Candaş ERÇETİN, Emin UYSAL, Süleyman SOLAK, Aytaç BİRİCİK, Hakan YİĞİTBAŞ, Osman Bilgin GÜLÇİÇEK, Ali SOLMAZ, Rıza KUTANİŞ

Assessment of Legal Capacity in the Geriatric Population: A Retrospective Study 350-355

Geriatrik Popülasyonda Hukuki Ehliyetin Değerlendirmesi: Retrospektif Çalışma

Mehmet CAVLAK, Aysun ODABAŞI BALSEVEN, Ramazan AKÇAN, Mahmut Şerif YILDIRIM Aykut LALE, Eyüp Ruşen HEYBET, Ali Rıza TÜMER

Correlations of Histopathological Features with Axillary Lymph Node Invasion Among Patients with Breast Cancer in Geriatric and Non-Geriatric Populations 356-360

Meme Kanserli Yaşlı ve Genç Hastalarda Histopatolojik Özellikler ve Bunların Koltuk Altı Lenf Bezi Tutulumu ile İlişkisi

Şahin KAHRAMANCA, Oskay KAYA, Hakan GÜZEL, Bülent Çağlar BİLGİN, Tezcan AKIN, Gülay ÖZGEHAN, Bertan KÜÇÜK, Hülagü KARGICI

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İÇİNDEKİLER (CONTENTS)

2014 17/4

Forensic Autopsies of Geriatric Deaths Conducted in Elazig 361-365
Elazığ'da Adli Otopsisi Yapılan Geriatrik Ölümlerin Değerlendirilmesi
Abdurrahim TURKOGLU, Mehmet TOKDEMİR, Turgay BORK, Ferhat Turgut TUNCEZ

A Comparison Study of Single Dose Versus Continuous Subarachnoid Levobupivacaine for Transurethral Resection 366-372
Transüretral Rezeksiyonda Tek Doz ve Sürekli Subaraknoid Levobupivakain Uygulamasının Karşılatırılması
Şeyda PEZEK AYDIN, Füsun BOZKIRLI

Investigation of the Effects of Anesthesia Techniques on Intensive Care Admission and Postoperative Mortality in Elderly Patients Undergoing Bilateral Knee Replacement Surgery 373-378
Bilateral Diz Protezi Nedeniyle Opere Olan Yaşlı Hastalarda Anestezi Tekniklerinin Yoğun Bakıma Giriş ve Postoperatif Mortaliteye Etkisinin Retrospektif Olarak İncelenmesi
Elif DOĞAN BAKI, Özal ÖZCAN, Mehmet Ersegün DEMİRBOĞAN, Serdar KOKULU, Hanife UZEL Yüksel ELA, Remziye Gül SIVACI

Prevalence and Risk Factors of Urinary Incontinence and Its Impact on Quality of Life Among 65 Years and Over Women Who Lived in Rural Area 379-388
Kırsal Alanda Yaşayan 65 Yaş ve Üzeri Kadınlarda Üriner İnkontinans Görülme Sıklığı, Risk Faktörleri ve Yaşam Kalitesi Üzerine Etkisi
Tuba DEMİREL, Belgin AKIN

Assessment of Geriatric Patients' Satisfaction on Hearing Aids and Their Influence on Quality of Life 389-396
Geriatrik Hastaların İşitme Cihazı Memnuniyetinin ve Cihazların Yaşam Kalitesine Etkisinin İncelenmesi
Özgül AKIN ŞENKAL, Ayşen KÖSE, Songül AKSOY

Investigating the Effects of Poverty on Health and Quality of Life in Poor People Aged 65 and Over in Etimesgut District, Ankara 397-403
Ankara Etimesgut İlçesinde Yaşayan 65 Yaş ve Üzeri Yoksul Bireylerde Yoksulluğun Sağlık ve Yaşam Kalitesi Üzerine Etkisinin İncelenmesi
Fikriye YILMAZ, Cansu ÇELİK, Rukiye NUMANOĞLU TEKİN

Acceptability, Reliability and Validity of the Turkish Version of the De Morton Mobility Index in Elderly Patients with Knee Osteoarthritis 404-409
Diz Osteoartriti olan Yaşlı Hastalarda De Morton Mobilite İndeksi'nin Türkçe Versiyonunun Kabul Edilebilirlik, Geçerlik ve Güvenirliği
Zeliha Özlem YÜRÜK, Aydan AYTAR, Emine Handan TÜZÜN, Levent EKER, İnci YÜKSEL, Natalie A. De MORTON

How Effective are Exercise Recommendations Supported by Written and Visual Materials in Elderly People? 410-416
Yazılı ve Görsel Materyallerle Desteklenen Egsersiz Önerileri Yaşlı Bireylerde Ne Kadar Etkili?
Fatma BAŞALAN İZ, Emrah ATAY

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İÇİNDEKİLER (CONTENTS)

2014 17/4

www.geriatri.org

DERLEME (REVIEW ARTICLE)

➲ **Geriatrics and Natural Law: The Missing Link** **417-422**
Doğal Hukuk ve Geriatri: Gözden Kaçan Bağ
Erdem İlker MUTLU

OLGU SUNUMU (CASE REPORT)

➲ **Paraplegia in an Elderly Patient Due to Pott's Disease** **423-425**
Yaşlı Bir Hastada Pott Hastalığına Bağlı Gelişen Parapleji Olgusu
Bahri TEKER, Mehmet AĞIRMAN, Tuğrul ÖRMECİ, Mehmet TEZER, Ali MERT, Engin ÇAKAR

➲ **Hypoglycemia Caused by Ciprofloxacin in a Non-Diabetic Elderly Patient: A Case Report** **426-430**
Diyabetik Olmayan Yaşlı Bir Hastada Siprofloksasinin Neden Olduğu Hipoglisemi: Bir Vaka Sunumu
Dilek ARPACI, Aysel Gürkan TOÇOĞLU, Bilal Seyyid AÇIKGÖZ, Ali TAMER

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Gönül URALOĞLU[2]
Barın SELÇUK[1]
Aydan KURTARAN[3]
Elif YALÇIN[3]
Murat İNANIR[1]
Ilgın SADE[1]
Müfit AKYÜZ[3]

İletişim *(Correspondance)*

Barın SELÇUK
Kocaeli Üniversitesi Tıp Fakültesi Fiziksel Tıp ve Rehabilitasyon Anabilim Dalı KOAELİ

Tlf: 0262 303 86 33
e-posta: barinselcuk@yahoo.com

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(Accepted)

[1] Kocaeli Üniversitesi Tıp Fakültesi Fiziksel Tıp ve Rehabilitasyon Anabilim Dalı KOAELİ
[2] Turkuaz FTR Merkezi, FTR TRABZON
[3] Ankara Fizik Tedavi ve Rehabilitasyon Eğitim ve Araştırma Hastanesi Fiziksel Tıp ve Rehabilitasyon ANKARA

RESEARCH

ASSESSMENT OF THE BOWEL DYSFUNCTIONS IN STROKE PATIENTS

ABSTRACT

Introduction: To asses bowel dysfunction in stroke patients, especially constipation and fecal incontinence, and to describe the factors that play a role in these conditions.

Materials and Methods: The study enrolled 112 patients with stroke. A detailed gastrointestinal symptom evaluation of the pre-and post-stroke period was performed, with special attention to constipation and fecal incontinence, The functional status of patients was evaluated using the Functional Independence Measurement, Brunstroom staging was used for the motor examination, and ambulation status was evaluated with the Functional Ambulation Scale.

Results: While only 29 patients had constipation prior to stroke, 83 patients were found to have post-stroke constipation. None of our patients complained of fecal incontinence in the pre-stroke period, although 23 patients developed fecal incontinence after stroke. We found that bowel dysfunctions such as constipation and fecal incontinence were not correlated with aphasia, thromboembolic or hemorrhagic stroke, side of stroke, medication, diabetes or gender. There were no significant relationships between the presence of constipation and patient age, Brunnstrom stage or functional ambulation scale score. Patients with low Brunnnstrom stage scores and functional ambulation scale scores, and also those over age 65, experienced more fecal incontinence.

Conclusions: Neurogenic bowel, which adversely affects the patient's quality of life, is a frequently encountered problem after stroke.

Key Words: Stroke; Constipation; Fecal Incontinence; Neurogenic Bowel.

ARAŞTIRMA

İNMELİ HASTALARDA BARSAK FONKSİYON BOZUKLUKLARININ DEĞERLENDİRİLMESİ

ÖZ

Giriş: İnmeli hastalarda konstipasyon ve fekal inkontinans başta olmak üzere bağırsak fonksiyon bozukluklarını değerlendirmeyi ve bunlara etki eden faktörleri ortaya koymayı amaçladık.

Gereç ve Yöntem: Çalışmaya 112 inmeli hasta alındı. Hastaların inme öncesi ve sonrasını içeren özellikle konstipasyon ve fekal inkontinans olmak üzere ayrıntılı gastrointestinal sistem sorgulaması yapıldı. Hastaların fonksiyonel durumları fonksiyonel bağımsızlık ölçümü ile, motor muayeneleri Brunstroom evrelemesi ile, ambulasyon durumları ise fonksiyonel ambulasyon skalası ile değerlendirildi.

Bulgular: İncelenen 112 hastanın inme öncesi 29'unda, inme sonrası ise 83'ünde konstipasyon vardı. İnme öncesi 112 hastanın hiçbirinde fekal inkontinans yokken, inme sonrası ise 23 hastada fekal inkontinansı bulundu. Hastalardaki konstipasyon ve fekal inkontinans gibi barsak disfonksiyonlarının afazi, tromboembolik veya hemorajik inme, sağ veya sol taraf inme, kullanılan ilaçlar, diyabet ve cinsiyet ile ilişkili olmadığı görüldü. Hastaların yaşı, Brunnstrom ve fonksiyonel ambulasyon skala evreleri ile konstipasyon varlığı arasında ilişki yoktu. Brunnstrom ve Fonksiyonel ambulasyon skala evresi düşük olan ayrıca 65 yaş üstü hastalarda daha fazla fekal inkontinansa rastlandı.

Sonuç: Sonuç olarak nörojenik barsak, inmeli hastalarda sık karşılaşılan, hastanın yaşam kalitesini olumsuz etkileyen, bir sorundur.

Anahtar Sözcükler: İnme; Konstipasyon; Fekal İnkontinans; Nörojenik Bağırsak.

Introduction

Neurogenic bowel dysfunction is a common complication of stroke and has adverse effects on rehabilitation, functional status and quality of life. In stroke patients, the most common symptoms associated with bowel dysfunction are constipation and fecal incontinence. The frequency of constipation has been reported to be 55% in the acute phase and 30-60% in the subacute and chronic phases. Fecal incontinence has also been reported to be 55% in the acute phase, falling to 11-22% in the subacute and chronic phases (1-6).

The etiology of bowel dysfunction in patients with stroke is multifactorial. Inactivity, depression, deficiencies in water and food intake, reduction in exercise capacity, drug usage, cognitive disorders, impaired consciousness and changes in the central and peripheral nervous systems all play an important role (1-5).

In this study we aimed to assess bowel dysfunction in stroke patients, especially constipation and fecal incontinence, and also to determine the factors that influence these conditions.

Material and Methods

One hundred and twelve stroke patients who applied to an inpatient rehabilitation program at our hospital and who met the inclusion criteria were enrolled in the study. Patients' demographic data, disease duration, and the type and side of the lesion were recorded. Other neurological problems associated with stroke (aphasia, cerebellar dysfunction), systemic disorders (hypothyroidism, hypertension, DM) and drugs used (beta blockers, ACE inhibitors, Ca channel blockers, antithrombocytes, anti-depressants) were noted.

Those with a history of gastrointestinal problems or diseases, abdominal and anorectal surgery, diseases that reduce colonic motility such as diabetes mellitus and hypothyroidism, the stroke duration of less than one month or longer than one year, bilateral hemiplegia, brain stem lesions, more than one attack, and additional neurological disorders were excluded from the study.

Patients were asked detailed questions about their gastrointestinal system (GIS) functioning before and after stroke. Topics included bowel emptying intervals and times, problems causing gastrointestinal symptoms (dysphagia, gastroesophageal reflux, nausea, vomiting, abdominal distention, abdominal pain, gastrointestinal bleeding, hemorrhoids and perianal problems such as rectal bleeding, and difficulty in passing stools), constipation and continence problems, drugs used for intestinal problems, and methods used to facilitate defecation. All patients were evaluated by ultrasound to investigate abdominal pathologies.

Constipation was defined as the presence of two or more of following Rome Criteria (7): Intestinal emptying less than 3 times per week, over-strain, considerable effort in at least 25% of bowel emptying, the presence of pellets in at least 25% of stools, the feeling of not purging completely in at least 25% of bowel emptying, the feeling of anorectal obstruction in at least 25% of bowel emptying, and at least 25% of bowel emptying requiring digital assistance. Fecal incontinence was defined as defecation at unwanted and unplanned times apart from bowel care (8).

The functional status of patients was assessed using the functional independence measure (FIM). Brunnstrom's stages of motor recovery was determined and ambulation status was evaluated using the functional ambulation scale (FAS). Patients were divided into two groups: nonfunctional ambulatory (FAS grade 0) and functional ambulatory (FAS stage 1, 2, 3 and 4).

Statistical analysis was performed using SPSS 13.0. For descriptive data, means ± standard deviations were calculated; categorical variables were shown as frequencies and percentages. Gastrointestinal problems in patients before and after stroke were compared using the Mc Nemar test. Student's t test was used to compare the elapsed time for toilet use before and after stroke and the range of bowel emptying times. Pearson's chi-square test was used to compare independent variables (patient age, FAS, the presence of urinary incontinence, duration of disease variables and the presence of constipation and fecal incontinence), while Spearman's correlation test for nonparametric data was used to evaluate the linear relationships among the other variables. Statistical significance for all tests was set at $p < 0.05$.

Results

The mean age of the 112 patients enrolled in the study was 62.5 ± 13.0 (22-87) years: 53 (47.3%) were men and 59 (52.7%) were women. Mean disease duration was 4.1 ± 2.8 (1-12) months. While 29 patients (25.9%) suffered a hemorrhagic cerebrovascular accident (CVA), 83 (74.1%) had had ischemic stroke. Forty-nine (43.8%) patients had right hemiplegia and 63 (56.2%) patients had left hemiplegia.

While the average median interval of pre-stroke intestinal emptying was 1.53±0.95 days, after stroke this increased to

Table 1— Intestinal Emptying ıntervals and Emptying Times Before and After Stroke.

	Before Stroke		After Stroke		
	n	%	n	%	p
Every day	72	64.3	26	23.2	< 0.01
Every other day	26	23.2	16	14.3	< 0.01
More than 3 days	13	11.6	56	50.0	< 0.01
Weekly	1	0.9	14	12.5	< 0.01

3.27±1.96 days. The average elapsed time for intestinal emptying was 5.72±3.47 minutes pre-stroke and 11.74±7.36 minutes after stroke. Intestinal emptying intervals and emptying time after stroke were significantly higher than pre-stroke values (p <0.01 for both); these variables are presented in Table 1. Results of the detailed questions about gastrointestinal system functioning showed a statistically significant rise in regurgitation, stomach pain, nausea, vomiting, abdominal pain, abdominal distension, rectal bleeding, and difficulty in emptying the stools after stroke, compared to pre-stroke (p<0.01). For gastrointestinal bleeding and hemorrhoids, there was no significant difference between pre-stroke and after stroke values (Table 2).

While 29 (25.9%) of 112 patients had constipation before stroke, 83 (74.1%) patients had constipation after stroke. None of the 112 patients had fecal incontinence before stroke, while fecal incontinence was found in 23 (20.5%) patients after stroke. The differences in constipation and fecal incontinence rates before and after stroke were found to be statistically significant (p<0.01).

No significant differences were found among age groups, type of lesion (hemorrhagic and ischemic), side of lesion, duration of disease and presence of constipation and fecal incontinence for the patients enrolled in our study (p>0.05). The frequency of fecal incontinence was significantly lower in patients under the age of 65 than in those over age 65 (p<0.05). Further, no significant relationships were found between the incidence of constipation and fecal incontinence and the use of medications taken by patients (p>0.05).

No significant relationships were found between constipation and Brunnstrom stages of the extremities (p> 0.05). While 77.5% of patients with FAS stage 0 had constipation, 72.2% of patients with FAS 1 and over had constipation. However, this difference was not statistically significant (p> 0.05). While there was no significant correlation between Brunnstrom hand scores and fecal incontinence (p>0.05), the relationships between upper and lower extremity Brunstrom phases and fecal incontinence were statistically significant (p<0.02 and p<0.01, respectively): the worse the lower extremity Brunnstrom phase, the higher the frequency of fecal incontinence.

The FIM total score was 64.8±22.0 in patients with constipation and 77.5±22.0 in patients without constipation. There were strong, significant negative correlations between the incidence of constipation and FIM self-care (r=-0.65), sphincter control (r=-0.51) and FIM total scores (r=-0.75) (p<0.05). There were no significant correlations between constipation and FIM mobility (r = 0.34), repositioning (r=0.28), communication and social sensing section scores (r=0.28) (p>0.05).

Although 47.5% of patients with FAS stage 0 had fecal incontinence, 52.5% did not; 5.5% of the 72 patients with

Table 2— Gastrointestinal System Problems Before and After Stroke.

	Before Stroke		After Stroke		
	n	%	n	%	p
Regurgitation	11	9.8	30	26.8	< 0.01
Stomach pain	22	19.6	37	33.0	< 0.01
Nausea- vomiting	2	1.8	20	17.9	< 0.01

FAS stage 1 and over had fecal incontinence and 94.5% did not. Fecal incontinence was observed significantly more frequently in the FAS Stage 0 group than in the FAS Stage 1 and over group ($p<0.05$).

The FIM total mean score was 43.5±16 for patients with fecal incontinence and 74.4±2. for patients without fecal incontinence. Strong, significant negative correlations were found between the incidence of incontinence and FIM self-care ($r=-0.75$, $p<0.00$), FIM sphincter control ($r=-0.9$, $p<0.00$), mobility ($r=-0.67$, $p<0.00$), displacement ($r=-0.52$, $p<0.00$), FIM communication ($p<0.04$), and FIM social recognition ($r=-0.43$, $p<0.01$) scores. Furthermore, there was a significant negative correlation between the incidence of fecal incontinence and FIM total scores ($r=-0.9$, $p<0.01$).

While 20 (17.9%) patients used defecation promoters or methods before stroke, 92 (82.1%) did not. We found that 89 (79.4%) patients used one or more medications and/or methods to promote defecation after stroke, while 23 (20.5%) patients used none; this difference was statistically significant ($p<0.01$).

Discussion

One unfavorable prognostic factor in the rehabilitation and functional status of patients with stroke is the presence of gastrointestinal problems. Dysphagia and bowel function disorders are the most frequently encountered gastrointestinal complaints after stroke (1,9,10).

Although there are extrinsic changes in the intestinal nervous system in neurological diseases that affect the central nervous system, the intrinsic nervous system remains functional and intact. Lesions affecting central control of defecation may involve both the sympathetic and parasympathetic components of defecation, reducing the coordination of peristaltic waves. In addition, the pelvic floor muscles and external sphincter may relax, leading to fecal incontinence (2). As in swallowing, cortical control of defecator function is localized in both hemispheres but is dominant in one hemisphere (11). Through topographic cortical mapping with transcranial magnetic stimulation, it has been shown that cortical control of defecation is located bilaterally in the motor cortex of the superior portion of both cerebral hemispheres (1,12). When the dominant center of defecation after stroke is damaged, its single clinical symptom may be constipation. Contralateral centers may be insufficient to maintain anorectal functions (1).

The etiology of bowel dysfunction in patients with stroke may be multifactorial. Inactivity, depression, deficiencies in water and food intake, reduction of exercise capacity, drug use, cognitive impairment, impaired consciousness and changes in the central and peripheral nervous systems play important roles (1-5).

In stroke patients, the most common symptoms associated with bowel dysfunction are constipation and fecal incontinence. While the rate of constipation in the acute phase is 55%, it has been reported as 30-60% in the subacute and chronic phase (1-6).

In the normal population, old age and female gender are predisposing factors for constipation. However, studies conducted with stroke patients have reported no significant relationships between constipation and age and gender (1,5,13). The absence of gender and age as factors in constipation for stroke patients supports the view that their bowel dysfunction is neurological in origin. The incidence of constipation does not differ significantly between thromboembolic and hemorrhagic infarct patients (2,5). Constipation has been found to be independent of specific brain lesion region and left or right hemisphere lesion, but is directly proportional to lesion size. This finding is related to the widespread involvement of different sites of brain damage (1). In our study, there was no correlation between the frequency of constipation and patients' age and gender, similar to previous studies. In addition, there was no relationship between the hemiplegic side and etiology of stroke and the presence of constipation. That the constipation occurs similarly in right and left hemiplegia supports the suggestion that the defecator center is located in both hemispheres.

In many studies, addiction and loss of physical activity have been shown to be largely responsible for constipation in stroke patients (2,5,14). In a study of 152 patients with hemiplegia, Robada found that Barthel Index scores of constipated patients were significantly low; they reported that there was less constipation among patients who were independent in activities of daily living (ADL) (5). Bracci compared 90 hemiplegic patients and 81 orthopedic patients who had similar mobility scores; they found a higher frequency of constipation in the hemiplegic group (1).In our study, 74.1% of stroke patients had constipation, and the presence of constipation was significantly higher than before the stroke. We found that the frequency of constipation was higher for patients whose FIM self-care, FIM sphincter control and FIM total scores were low. We did not find a significant relationship between constipation and FIM mobility, FIM relocation, FIM

communication, and FIM social perception scores. In addition, constipation was more frequent in our patients who had early-stage FAS but this finding was not statistically significant. There were no relationships between constipation and Brunnstrom stages in our patients. Results of our study not only associate constipation in hemiplegic patients to physical inactivity, but also support the suggestion that neurological mechanisms are involved in the development of constipation. As a result of damage to the central nervous system, control of the extrinsic nervous system of the intestine is affected; consequently, the regulation of bowel movements is disrupted and constipation is encountered clinically.

Drugs usage has been implicated as one factor affecting constipation in hemiplegic patients (1,2,5,15). Bracci detected highly significant correlations between constipation and the use of nitrates, glycosides and antithrombotics, while they did not find significant relationships between constipation and ACE inhibitors, Ca channel blockers, anticoagulants, anticonvulsants, and antidepressants (1). In our study, no statistically significant correlations were found between constipation and medications which are commonly used by patients. Significant drugs lead to constipation, whereas our patients has been using multiple drugs and this is why we couldn't detect the significant drugs' effect on constipation and got the insignificant result. Also Bracci said that the drugs inducing constipation could not be properly assessed since 35-70% of the patients received combination therapy (1).

Sixty eight percent of the patients included in our study had difficulty with defecation. To facilitate defecation, 56.3% of our patients used multiple treatments or methods. In our study, a high proportion of patients' drug usage may have been caused by not informing them about necessary diet changes earlier, and also by failing to explain that treatments are not for long-term use but to provide daily discharges. These results demonstrate that, in addition to disrupting the quality of life of stroke patients, constipation increases treatment costs and adds the burden of excessive use of drugs. In our study, we found a significant increase after stroke in gastrointestinal symptoms associated with bowel dysfunction, such as regurgitation, abdominal distension and pain, rectal bleeding after defecation, nausea, and vomiting. There was no increase in the presence of hemorrhoids, which we expected to accompany chronic constipation. The reason for insignificant result for presence of hemorrhoid could be because of being the patients' evaluation at a sectional period, while the anamnesis of the rectal bleeding was concerning whole period of the stroke.

While fecal incontinence in the acute phase was 55%, it has been reported to occur at the rate of 3-22% in subacute-chronic periods (1-6). Fecal incontinence after stroke is encountered at the rate of 31-40% within the first 2 weeks (4,16-18). A large proportion of early onset fecal incontinence after stroke may be temporary and usually seems to be related to impairment of consciousness, immobility, and poor patient care after neurological damage (1,19). Brittain showed that fecal incontinence in stroke survivors was 3.5 times higher than in control group(20). Fecal incontinence was 3-11% in the three months following stroke and in the next period (4,17). In their study, Brocklehurst reported that fecal incontinence was observed in 31% of 135 hemiplegic patients, most of whom had been seen in the first 2 weeks post-stroke (18). Fecal incontinence was observed in 14% of patients in the 8th week after stroke. In studies by Brittain and Nakayama, the fecal incontinence rate, initially around 40%, was reported to be 9% after 6 months (16,17). Quand reported that the fecal incontinence rate in their chronic stroke patients was 22% (21). In our study, 20.5% of 112 patients had fecal incontinence.

Nakayama found a higher rate fecal incontinence in women than men in the first week after stroke (17), while Quand found no differences between men and women on the same variable (21). In our study there was no significant correlation between the gender of patients and fecal incontinence. Nakayama found a significant relationship between age and fecal incontinence after stroke: for each 10-year increase in age they found that fecal incontinence increased 1.5 times (17). Our results were similar, in that fecal incontinence was found in only13.6% of patients under age 65, but this rose to 28.3% for patients over age 65.

Brocklehoust found that fecal incontinence was associated with being unable to turn in bed, get out of bed, or stand (18). Nakayama reported that patients with fecal incontinence had low Barthel Index (17). In our study, similar to those reviewed above, stages of the FAS were lower in patients with fecal incontinence; this included functional independence scores in all sections, as well as total scores. In addition, upper and lower extremities Brunnstrom stages of patients with fecal incontinence were lower. Unlike the data for constipation, these results show that fecal incontinence depends on factors that may be modified, and which develop secondary to hemiplegia such as loss of mobility, functional disability, inadequacy of transfers, toilet access difficulties, cognitive impairment, communication difficulties and poor maintenance, in addition to neurological damage.

Brocklehoust found that left hemiplegia is more associated with fecal incontinence than is right hemiplegia (18). However, Bracci could not detect a difference between right, left or different brain lesion localizations and the frequency of fecal incontinence (1). While Nakayama did not find a relationship between the hemiplegic sides, they did find that lesions that were hemorrhagic, large and involved the cerebral cortex constituted risk factors. In our study we did not find a relationship between fecal incontinence and hemiplegic side (17).

After stroke, neurogenic bowel and related problems are common (22). In our study, the frequency of constipation and fecal incontinence increased, and both intestinal discharge times and the discharge interval were extended. Moreover, significant correlations were found between the various parts of FIM and constipation and the frequency of fecal incontinence. In the presence of a neurogenic bowel condition, constipation is an important and frequent gastrointestinal problem. Initially, it is not perceived as a major problem by patients and their relatives. Further, it makes patient care easy because it decreases the frequency of fecal incontinence. However, as duration of the disease progresses, it causes an increase in the duration of intestinal emptying and an extension of emptying intervals. This situation increases the problem of constipation and leads to a vicious cycle. Moreover, the incidence of gastrointestinal symptoms such as abdominal pain, abdominal distension, and rectal bleeding increases along with constipation. This condition leads to the use of more medication and methods to facilitate discharging the intestine after stroke. In addition, the increase in the frequency of fecal incontinence may cause significant restrictions on the social life of patients and their caregivers. An increase in the time required for bowel care and resulting symptoms poses a significant problem for patients and their relatives, and is considered a high-priority issue.

In general, neurogenic bowel and the consequent constipation and fecal incontinence are problems in subacute and chronic stroke patients that causes difficulties in rehabilitation programs, where it needs to be addressed.

The major limitations of this study are being a cross-sectional study, periodic comparisons not to be made and a large period of stroke patients to be included the study.

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Recep AKTİMUR[1]
Süleyman ÇETİKKÜNAR[2]
Kadir YILDIRIM[1]
Sabri ÖZDAŞ[3]
Sude Hatun AKTİMUR[4]
Elif ÇOLAK[1]
Hakan GÜZEL[5]
Mehmet Derya DEMİRAĞ[6]
Nuraydın ÖZLEM[1]

İletişim *(Correspondance)*

Recep AKTİMUR
Samsun Eğitim ve Araştırma Hastanesi
Genel Cerrahi Kliniği, Samsun

Tlf: 0545 668 02 01
e-posta: recepaktimur@gmail.com

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(Accepted)

[1] Samsun Eğitim ve Araştırma Hastanesi Genel Cerrahi, Kliniği SAMSUN
[2] Adana Numune Eğitim ve Araştırma Hastanesi Genel Cerrahi Kliniği ADANA
[3] Adıyaman Eğitim ve Araştırma Hastanesi Genel Cerrahi Kliniği ADIYAMAN
[4] Ondokuz Mayıs Üniversitesi Tıp Fakültesi Hematoloji Kliniği, İç Hastalıkları SAMSUN
[5] Ankara Dışkapı Yıldırım Beyazıt Eğitim ve Araştırma Hastanesi Genel Cerrahi Kliniği ANKARA
[6] Samsun Eğitim ve Araştırma Hastanesi , Romatoloji Kliniği, İç Hastalıkları SAMSUN

RESEARCH

COMPARISON OF THE OUTCOMES OF WATCHFUL WAITING AND SURGERY IN 80 YEARS OF AGE AND OLDER COMORBID AND MINIMALLY SYMPTOMATIC INGUINAL HERNIA PATIENTS

ABSTRACT

Introduction: With the growing proportion of elderly people in the population, surgeons are dealing with more frail patients. In addition, the prevalence of inguinal hernia increases with age. We aimed to compare the outcomes of watchful waiting and surgery in inguinal hernia patients who were 80 years of age and older had comorbidities and were minimally symptomatic.

Materials and Method: Two high volume, mostly comorbid patient treating tertiary care education hospitals' databases were searched for inguinal hernia patients ≥80 years of age. One hundred and fifty four of the 324 patients treated between April 2010 and April 2014 were included in this study. Demographic characteristics, comorbidities and patient reported outcomes were recorded from the database and telephone calls.

Results: Mean patient age was 83±2.8 years and median follow-up time was 15 months. At diagnosis, 17 (11%) patients chose surgery, 137 patients were observed; of these, 74 (54.1%) crossed over to surgery, 48 (64.8%) elective and 26 (33.2%) emergency. The emergent operation rate for observation group was 18.9%. Crossover was found to be corelated with emergency admission before the diagnosis, increased pain in admission, low American Society of Anesthesiologists score, bowel resection and complications. Four patients were died within 30-days postoperatively, three in emergent and one in elective crossover. Mortality was corelated with heart failure and bowel resection.

Conclusion: Although recommending watchful waiting for 80 years of age and older inguinal hernia patients with comorbidities and minimal symptoms sounds logical, the natural course of these patients is intriguing. Planned herniorrhaphy under local anaesthesia for extremely old and comorbid patients seems more acceptable today.

Key Words: Hernia, Inguinal; Aged; Comorbidity; Observation.

ARAŞTIRMA

SEKSEN YAŞ VE ÜZERİ KOMORBİD VE MİNİMAL SEMPTOMATİK İNGUİNAL HERNİ HASTALARINDA TAKİP İLE OPERASYON SONUÇLARININ KARŞILAŞTIRILMASI

ÖZ

Giriş: Yaşlı popülasyonun artışı ile birlikte cerrahlar disabilite oranı yüksek inguinal herni hastalarıyla daha fazla karşılaşmaya başlamışlardır. Bu çalışmada 80 yaş ve üzeri komorbid ve minimal semptomatik inguinal herni hastalarında takip ile operasyon sonuçlarının karşılaştırılması amaçlanmaktadır.

Gereç ve Yöntem: İki yüksek kapasiteli, çok sayıda komorbid hasta tedavi eden eğitim hastanesinin 80 yaş ve üzeri inguinal herni hastaları tarandı. Nisan 2010 ve Nisan 2014 arasında saptanan 324 hastanın 154'ü çalışmaya dahil edildi. Kayıtlara ve telefon konuşmalarına göre demografik veriler, komorbidite ve hasta tarafından tariflenen sonuçlar kaydedildi.

Bulgular: Ortalama yaş 83±2.8 ve ortanca takip süresi 15 ay olmuştur. Tanı anında 17 (%11.0) hasta operasyonu seçti. 137 takip hastasının 74'ü (%54.1) elektif ya da acil koşullarda opere edildi, 48 (%64.8), 26 (%33.2). Tüm takip grubu için acil operasyon oranı %18.9'du. Operasyona geçiş; tanı öncesi acil başvurusu, başvuruda şiddetli ağrı, düşük Amerikan Anestezistler Derneği skoru, barsak rezeksiyonu ve komplikasyon ile ilişkili idi. Acil operasyon grubunda üç, elektif operasyon grubunda bir hasta postoperatif 30 gün içinde öldü. Mortalite ile kalp yetmezliği, ve barsak rezeksiyonu ilişkili bulundu.

Sonuç: Günlük pratikte 80 yaş ve üzeri komorbid ve minimal semptomatik hastalara takip önermek mantıklı görünse de, bu hastaların doğal seyri düşündürücüdür. Günümüzde, ileri derecede yaşlı ve komorbid hastalar için lokal anestezi altında planlı herniorafi daha makul bir seçenek olarak görünmektedir.

Anahtar Sözcükler: İnguinal Herni; Yaşlı; Komorbidite; Takip.

Introduction

Inguinal hernia (IH) repair is one of the most commonly performed operations worldwide. With the growing proportion of elderly people in the population, surgeons are dealing with a larger number of older and more frail patients. Compounding the growing elderly population, the prevalence of IH increases with age. The overall IH rate for people aged over 75 has been found to be as high as 29.8% (1). Many of these patients are asymptomatic or minimally symptomatic. Although the reported outcome of IH repair is mostly uneventful in all age groups, recommending an operation to this group is hard for surgeons. From the surgeon's side, it has been shown that the geriatric population has an increased morbidity and mortality rate after surgery (2). In addition, patients and relatives generally hesitate in the face of the surgical risks and refuse surgery. Despite the classical treatment recommendation for IHs, sometimes surgeons and patients delay hernia repair. On the other hand, when an incarceration or strangulation occurs, bowel resection and overall mortality rate increase to 19% and 5%, respectively (3). Therefore, an emergent hernia repair could change an elective and uneventful surgery to a mortality, especially in older and comorbid patients. Some recent randomized clinical trials have shown that watchful waiting is safe in minimally symptomatic men, but this approach is not justified for patients over 80 years of age, and for more comorbid patients (4,5). These patients are generally more frail than previously studied groups, and the expected outcome of an emergent surgery is more complicated.

We conducted a retrospective clinical study in mostly comorbid patients treated in two high- volume tertiary care education hospitals to compare the outcomes of watchful waiting and operation in IH patients who were ≥80 years old, comorbid and minimally symptomatic.

Materials and Method

Patient Selection

Two high-volume, mostly comorbid patient treating tertiary care education hospitals' databases were searched for 80 years of age and older IH patients (search ICD-10 codes were as follows: K40.0, K40.1, K40.2, K40.3, K40.4, K40.9). After the local ethics committee approval (SEAH-2014/21), 324 patient records dating from April 2010 to April 2014 were evaluated retrospectively. The IH diagnosis and recommended treatment options were confirmed from the surgeons' physical examination notes in the hospitals' database systems. Incomplete examination notes or treatment recommendation in the database were considered as exclusion criteria. Thirty two patients with recurrent IHs, 105 patients with incomplete data and unreachable telephone numbers and 33 patients with inconsistent answers during telephone calls were excluded. All telephone calls were made by two investigators. Patients and first-degree relatives who were living with them were considered accepable respondents in telephone conversations. For the first question, the respondent was asked which side the hernia was on; incorrect answers for this question were a further exclusion criterion. Patients' ASA scores were taken from the preoperative examination form from the Anesthesiology Clinics. Demographic characteristics, hernia types (according to Nyhus classification), comorbidities and patient-reported outcomes were recorded.

Study Design

A total of 154 patients were divided in four groups, operation (O), watchful waiting (WW), elective crossover (WW/ELC) and emergency crossover (WW/EMC); the groups had 17, 63, 48 and 26 patients, respectively. The need for an operation in the watchful waiting group during the follow-up time was considered a crossover, and patients who crossed to the operation arm were grouped seperately, according to whether the operation was elective or emergency (WW/ELC or WW/EMC). The watchful waiting group in this study consisted of patients who were followed non-operatively during the whole follow-up time. In the operation group, all patients underwent an open inguinal herniorrhaphy with mesh placement using the Lichtenstein technique. All operations were performed under spinal or general anaesthesia.

Demographics, hernia type, commonly encountered comorbidities, ASA scores, outcomes of operations, length of hospital stay, patient reported outcomes and disease related mortality were compared among the four groups. In bilateral hernia patients, dominant side of patient's complaints were taken into account, regarding to hernia type. Excitus in first the 30 days after the operation was considered as disease-related mortality. The primary outcome measures for this study were the crossover rate and crossover-related morbidity and mortality. The secondary outcome measures were the determination of predisposing factors for the crossover, and developing a strategy for treatment recommendations for advanced aged comorbid IH patients and their relatives.

Statistical Analysis

Continuous data were presented as median and range or mean±standard deviation (SD). Dichotomous and categorical data were presented as numbers with percentages. Normally

distributed continuous data were assessed with Student's t-Test for comparison of two groups and one-way ANOVA for comparison of three or more groups. If the data were not normally distributed, continuous data were assessed with the Kruskal-Wallis test for overall differences, and secondary analysis was conducted using the Mann-Whitney *U* test for differences between groups. The Chi square test was used for categorical data. A two-tailed p value of <0.05 was considered statistically significant. Statistical analyses were performed using SPSS, version 16.00 (Chicago, IL, USA).

RESULTS

The mean age was 83±2.8 years and the mean BMI was 24.8±4.6. The median follow-up time was 15 months (0-45 months). Statistically significant difference was found in hernia type in between the groups (p<0.001). In subgroup analysis, we have found significant difference in the presence of Nyhus type IIIA hernia (direct) (74.6%) in WW group when compared to O group (p<0.001). However, hernia type did not differ in WW/ELC and WW/EMC groups when compared to O group (p=0.353 and 0.104 respectively). In the same analysis, we have found significant differences in WW/ELC and WW/EMC groups when compared to WW group (p<0.001 and <0.001 respectively). Also, we have found significant differences in between WW/ELC and WW/EMC groups according to hernia type (p<0.001). Demographic characteristics, hernia types (according to Nyhus classification), comorbidities and ASA scores of the study groups are presented in Table 1.

Of 42 (27.6%, n=154) patients have had at least one emergency department admission before the IH diagnosis. Common complaints were pain and swelling in the inguinal

Table 1— Demographic Characteristics, Hernia Types (According to Nyhus Classification), Comorbidities and ASA Scores of the Study Groups.

	All Patients n=154	Operation n=17	Watchful Waiting n=63	Elective Crossover n=48	Emergency Crossover n=26	Overall p Value
Age, mean±SD	83±2.8	83.1±2.9	82.8±2.6	82.5±2.5	84.2±3.3	0.068
Sex, n (%)						
Male	129 (83.8)	16 (94.1)	52 (82.5)	47 (97.9)	14 (53.8)	<0.001
Female	25 (16.2)	1 (5.9)	11 (17.5)	1 (2.1)	12 (46.2)	
BMI, mean±SD	24.8±4.6	22.7±6.7	25.3±5.2	25±3.4	24.9±3.2	0.249
Hernia side, n (%)						
Right	87 (56.5)	9 (52.9)	33 (52.4)	26 (54.2)	19 (73.1)	
Left	60 (39)	6 (35.3)	28 (44.4)	20 (41.7)	6 (23.1)	0.411
Bilateral	7 (4.5)	2 (11.8)	2 (3.2)	2 (4.2)	1 (3.8)	
Nyhus type, n (%)						
Type I	5 (29.4)	4 (6.3)	5 (10.4)	12 (46.2)	26 (16.9)	
Type II	3 (17.6)	8 (12.7)	11 (22.9)	8 (30.7)	30 (19.5)	<0.001
Type IIIA	3 (17.6)	47 (74.7)	9 (18.8)	-	59 (38.3)	
Type IIIB	6 (15.4)	4 (6.3)	23 (47.9)	6 (23.1)	39 (25.3)	
DM, n (%)	36 (23.5)	3 (17.6)	19 (30.2)	10 (20.8)	4 (16)	0.416
Chronic obstructive pulmoner disease, n (%)	49 (31.8)	6 (35.3)	29 (46)	7 (14.6)	7 (26.9)	0.005
Hearth failure, n (%)	71 (46.1)	3 (17.6)	37 (58.7)	21 (43.8)	10 (38.5)	0.016
Chronic renal failure, n (%)	9 (5.9)	-	7 (11.1)	1 (2.1)	1 (4)	0.201*
ASA grade, n (%)						
Grade I	10 (6.5)	3 (17.6)	2 (3.2)	4 (8.3)	1 (3.8)	0.009*
Grade II	23 (14.9)	3 (17.6)	5 (7.9)	13 (27.1)	2 (7.7)	
Grade III	49 (31.8)	8 (47.1)	19 (30.2)	14 (29.2)	8 (30.8)	
Grade IV	72 (46.8)	3 (17.6)	37 (58.7)	17 (35.4)	15 (57.7)	
Follow-up time, median (min-max)	15 (0-45)	14.5 (2-40)	14 (1-41)	16.5 (0-45)	17 (0-42)	0.502

*Fisher's exact p value.

Table 2— Emergency Department Admission Before the Diagnosis and the Pain Severity at the Diagnosis.

	All Patients n=154	Operation n=17	Watchfu Waiting n=63	Elective Crossover n=48	Emergency Crossover n=26	Overall p Value
Emergency department admission before the diagnosis, n (%)	42 (27.6)	3 (17.6)	10 (16.1)	12 (25.5)	17 (65.4)	<0.001
Pain severity at the diagnosis, n (%)						
Mild	115 (74.7)	9 (52.9)	53 (84.1)	42 (87.5)	11 (42.3)	<0.001
Disturbing	39 (25.3)	8 (47.1)	10 (15.9)	6 (12.5)	15 (57.7)	

area. Emergency department admission before diagnosis and pain severity at diagnosis are shown in Table 2.

At diagnosis, only 17 (11%) of 154 patients chose surgery. 137 patients (89%) were observed, and 74 (54.1%) patients from the observation group crossed over to an operation. In the crossover group, 48 (64.8%) patients were operated electively and 26 (33.2%) patients were operated in emergency settings. The emergent operation rate for whole WW group was 18.9%. Elective and emergent crossover time of the observation group were listed as; first 6 months, 43.8%, 61.5%; second 6 months, 43.8%, 26.9%; and >1 year 12.4%, 11.5% respectively. Crossover time and operation indications for the WW/ELC and WW/EMC groups are presented in Table 3.

Tablo 3— Crossover Time and Operation Indication for WW/ELC and WW/EMC Groups

	Elective Crossover n=48	Emergency Crossover n=26
Crossover time, n (%)		
First 3 months	15 (31.2)	11 (42.3)
3-6 months	6 (12.5)	5 (19.2)
6-12 months	21 (43.8)	7 (26.9)
1-2 years	4 (8.3)	2 (7.7)
2-3 years	2 (4.2)	1 (3.8)
Operation indication, n (%)		
Pain	12 (25.0)	-
Increase of pain	36 (75.0)	1 (3.8)
Incarceration	-	6 (23.1)
Strangulation	-	15 (57.5)
Ileus	-	4 (15.4)

Emergent operation indications and bowel resection were found to be significantly increased in patients, who have high ASA scores (III-IV) (p=0.023 and 0.033 respectively). We have found significant difference in low ASA score in WW/ELC group when compared to WW group (p=0.002). In WW/EMC group we have found significant difference in emergency admission before the diagnosis (p<0.001) and increased pain in admission (p<0.001) when compared to WW group. When we compare postoperative outcomes of O, WW/ELC and WW/EMC groups; in WW/ELC group we have not found any difference, however, in WW/EMC group, we have found significant difference in bowel resection (p=0.001), complication (p=0.010) and postoperative contentment (p<0.001) when compared to O group. Hemorrhage, hematoma, seroma, urinary retention, infection and nerve entrapment were accepted as complications. The overall postoperative complication rate was 13.6%. Hernia-related mortality was seen only in the crossover groups: three patients in WW/EMC group and one patient in WW/ELC group died in first 30 days after the operation. Heart failure and bowel resection ratio were found to be increased significantly in the patients, who were died in first 30 days of operation. Disease-related mortality was not statistically significant in WW/ELC and WW/EMC groups when compared to O group (p=0.999 and 0.266 respectively). In WW/EMC group, bowel resection, postoperative complication and disease-related mortality risk increased 9.2, 4.2 and y5.4 fold, respectively. Patient outcomes according to group are shown in Table 4.

Discussion

This study was primarily intended to uncover the outcomes of watchful waiting for asymptomatic or minimally symptomatic ≥80 year old comorbid IH patients. The watchful

Table 4— Outcomes of the Patients According to the Groups.

	All Patients n=154	Operation n=17	Elective Crossover n=48	Emergency Crossover n=26	Overall p Value
Bowel resection, n (%)	15 (9.7)	1 (5.9)	-	14 (53.8)	<0.001*
Postop. complication, n (%)	21 (13.6)	2 (11.8)	6 (12.5)	13 (50)	0.001
Excitus in first 30 days, n (%)	4 (2.6)	-	1 (2.1)	3 (11.5)	0.107*
Hernia recurrence, n (%)	3 (1.9)	-	2 (4.2)	1 (3.8)	0.296*
Postop. contentment, n (%)					
Minimal	7 (7.7)	-	2 (4.2)	5 (19.2)	<0.001*
Moderate	7 (7.7)	2(11.8)	3 (6.2)	2 (7.7)	
Good	38 (41.8)	5 (29.4)	15 (31.2)	18 (69.2)	
Better	39 (42.9)	10 (58.8)	28 (58.3)	1 (3.8)	

*Fisher's exact p value

waiting concept arose from two randomized clinical trials, which were presented as the first evidence-based data about observation of an asymptomatic or minimally symptomatic IH in men (4,5). Fitzgibbon et al. concluded that watchful waiting of a minimally symptomatic IH is a safe and feasible alternative to open herniorrhaphy because of the rare incarceration rate and no greater risk of operative complications in the crossover group (4). O'Dwyer et al. showed no association between chronic pain and elective repair of an asymptomatic IH (5). They detected a higher rate of crossover than expected and concluded that elective operation may be beneficial to patients in improving overall health and reducing potentially serious morbidity. In the study by Fitzgibbon et al., men 18 years or older with asymptomatic or minimally symptomatic IH were followed up for 2 years, and O'Dwyer et al. studied men 55 years or older and published one year follow-up results. The outcomes of the patients from these trials were separately analysed in different studies for both crossover rate and complications (6–8). However, there are no another studies comparing the outcomes of operation and observation of IH in asymptomatic or minimally symptomatic patients. Further, there are no studies investigating this concept in elderly and comorbid patients. An increasing number of geriatric patients, and their accompanying comorbidities, need to be evaluated in every field of surgery, especially in the most commonly encountered conditions such as inguinal hernias. Therefore, the selected patient population of this study is of utmost importance for appropriate decision-making for both today and tomorrow.

We divided study participants into four groups to facilitate the interpretation of the results, as we already knew the course of the disease in this retrospective analysis. Our median follow-up time was 15 (0-45) months; according to previous trials, this time interval was considered sufficient to reach a conclusion (4,5). Age, BMI, hernia side, presence of DM or chronic renal failure and follow-up time were similar among the four groups. Sex, ASA score and presence of chronic obstructive pulmonary disease (COPD) or heart failure (HF) were found to be significantly different. Our group of patients had markedly higher rates of COPD and HF (46% and 58.7%) than patients described in the literature (9). In WW group most of the patients have had direct hernia (74.6%). The dominant hernia type in WW/ELC and WW/EMC groups were scrotal (47.9%) and indirect (46.2%) hernia. As we have no data about hernia type and treatment approach in previous studies, we have not compared our resuls. But, we have shown a trend to crossover in patients who have had indirect and scrotal hernia. In addition, the female proportion of our population was high (16.2%), but the real difference was in the distribution pattern (9). 12 of 25 women were in the WW/EMC group, and 11 of 25 were in the WW group. Although the number of woman in this study is too small to offer conclusions, as we have no data about the crossover status of women, we may speculate that older women are more likely to hesitate from the surgery than men, and more women experience hernia accidents. When we classified ASA scores into two groups, low and high (I-II, III-IV), we found that the WW and WW/EMC groups had an increased pro-

portion of high ASA scores: 88.9% and 88.5%, respectively. High ASA score patients were prone to observation, also emergent operation and bowel resection were increased in this patients. Our study population had much higher ASA scores than those reported in previous studies (10,11), but ASA score-related bowel resection risk increase was similar, at 9.2 vs 9.3 (12).

At diagnosis, only 17 (11%) of 154 patients chose the operation. This rate is relatively small but there are no data to compare it. Fitzgibbon and O'Dwyer conducted prospective studies, so they randomly chose a sufficient sample size for their operation group to compare data (4,5). Nevertheless, 17% of assigned surgical repair patients did not undergo repair in the Fitzgibbon et al. study. We suggest that the small size of the operation group in our study affected the statistical significance of our results; for accurate conclusions larger study groups are required. On the other hand, we have no data about this specific group of patients, so the reported rate may truly reflect the community setting. 74 (54.1%) patients from the entire WW group had crossed over to an operation at 15 months median follow-up time. It is noteworthy that the previously reported crossover rates for a 2 year follow-up were 23% and 26% for heterogeneous age groups in the studies of Fitzgibbon et al. and O'Dwyer et al., respectively. They studied younger and healthier patients, and concluded that with longer follow-up the crossover rate is even higher. Chung et al. reported a 72% crossover rate with a follow-up of 7.5 years for the patients from the O'Dwyer et al. study (7). In first 6 months, emergent crossover rate was higher than elective crossover (61.5% and 43.8% respectively). However, approximately 90% of our elective and emergent crossover patients were operated in the first year of the follow-up period. The limited median follow-up time of the present study makes it difficult to comment about long-term crossover rates, but we agree with O'Dwyer and Chung. Sarosi et al. found that hernia pain with strenuous activity at baseline was the strongest predictor of crossover in a selected proportion of the Fitzgibbons et al. study population. Marital status, low ASA score, chronic constipation and prostatism were also predictors (8). We found a significant relation between low ASA score and elective crossover. Good general health status was a facilitating factor in choosing elective operation, similar to the findings of Fitzgibbons et al. Also, in the WW/ELC group 36 (75%) patients were operated for increased pain, as in a previous report (8). Its noteworthy that, emergency admission before the diagnosis and increased pain in admission were found to corelated with emergency crossover. Of note; while bowel resection and complication rate were high in emergency crossover group; postoperative contentment were found to be lower. Also, disease-related mortality was found to be corelated with hearth failure. When advising a patient for observation or when a patient or her/his relatives request waiting, we must consider these factor as predictors of crossover, and also remember that an emergent operation for IH increases postoperative mortality up to ten-fold (13).

In the crossover groups, 48 (64.8%) patients were operated electively, and 26 (33.2%) patients were operated in emergency settings. In the WW/EMC group, patients were operated for increased pain (1, 3.8%), incarceration (6, 23.1%), strangulation (15, 57.5%) and ileus (4, 15.4%). Overall incarceration, strangulation and ileus rates for the whole WW group were 4.3%, 10.9% and 2.9%, respectively. The emergent operation rate for the whole WW group was 18.9% in our comorbid and ≥80 year old IH patients during the 15 months median follow-up time. Althought previously reported hernia accident rates were quite low, 1.25% by O'Dwyer et al. and 0.3% by Fitzgibbons et al., we know that hernia accident risk increases over time in elderly patients (14); in fact in 10 years the cumulative irreducibility rate may reach 30% (15). Nevertheless, our high accident rate may be considered patient- and population-related. Elderly patients with poor general health status were more hesitant to have surgery unless an emergent admission was required. Emergent crossover was found to be correlated with bowel resection, complication and postoperative contentment. 14 of 15 cases of strangulation in the WW/EMC group underwent a bowel resection; the 10.2% overall bowel resection rate for the whole WW group was quite different from the reported rate of 5.4% (16). The complication rate was found to be 11.8% (2) in the O group, 12.5% (6) in the WW/ELC group and 50% (13) in the WW/EMC group. These rates are different from a reported rate of 27.9%, but consistent with our discouraging outcomes (4). Four disease-related excitus were seen, one in the WW/ELC group and three in the WW/EMC group. All of these patients had an ASA IV score and several comorbidities. 3 of the 4 underwent bowel resection for acute presentation of strangulation. Overall mortality rate for whole WW group was 2.9%; according to a recent collective review, this rate is consistent with the 4% (0% - 22.2%) reported in the literature (17). We have found heart failure and bowel resection to be predictive factors of disease-related mortality. Emergent operations were increased mortality risk. Although the overall mortality ratio was consistent with the literature, the morbidity rate was quite high. For a preventible condi-

tion, the likelihood of high morbidity and mortality rates should be carefully evaluated, even in older and frail patients.

Our study population was quite different from the general population. The two hospitals in this study were the last stop for extremely comorbid and risky patients. Due to the role of our hospitals, this study group was an interesting one from which to draw conclusions. The gap in the literature about older IH patients' natural course must be filled with prospective randomized clinical studies. However, the results of our retrospective study suggest that a prospective design may be ethically unacceptable because of the higher hernia accident rate and related higher morbidity and mortality than expected. However, we have no data relating hernia accident to hospital admission time because of the study design. Our results may have been affected by late admission. Another concern was the absence of herniorrhaphy under local anaesthesia with day-case surgery in our hospitals' practice. In our regions, the IH operation is still performed under general and spinal anaesthesia. Due to our patients' expectations from surgeons, day-case surgery and operation with local anaesthesia still represent a very small proportion of our practice. The low hospital stay cost in our country is another facilitating factor. On the other hand, local anaesthesia may be the most beneficial approach for the elderly population. Today, the recommended approach to IH repair is day-case surgery with local anaesthesia, which is suggested to be safe and feasible even in elderly and comorbid patients (18–20).

Although recommending watchful waiting to ≥80 year old comorbid. minimally symptomatic, IH patients sounds logical, the natural course of these patients is intruiging. Planned herniorrhaphy under local anaesthesia for extremely old and comorbid patients seems more acceptable today, but we need large, prospective studies to confirm this conclusion.

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Erkan YAVUZ[1]
Candaş ERÇETİN[1]
Emin UYSAL[2]
Süleyman SOLAK[2]
Aytaç BİRİCİK[1]
Hakan YİĞİTBAŞ[1]
Osman Bilgin GÜLÇİÇEK[1]
Ali SOLMAZ[1]
RIza KUTANİŞ[1]

İletişim *(Correspondance)*

Candaş ERÇETİN
Bagcilar Training and Research Hospital, Department of General Surgery İSTANBUL

Tlf: 0212 440 40 00
e-posta: ercetin@istanbul.edu.tr

Geliş Tarihi: 31/08/2014
(Received)

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(Accepted)

[1] Bagcilar Training and Research Hospital, Department of General Surgery İSTANBUL
[2] Bagcilar Training and Research Hospital, Department of Emergency Medicine İSTANBUL

RESEARCH

DIAGNOSTIC VALUE OF NEUTROPHIL/LYMPHOCYTE RATIO IN GERIATRIC CASES WITH APPENDICITIS

ABSTRACT

Introduction: The aim of this study was to investigate the efficacy of the neutrophil/lymphocyte ratio in geriatric patients who consulted to the emergency department with a diagnosis of acute appendicitis.

Materials and Method: A total of 43 cases over 65 years of age operated with a diagnosis of appendicitis (Group 1) between January 2009 and December 2013, and 81 unoperated cases (Group 2; Control Group) were evaluated retrospectively. Age, gender, leukocyte count, neutrophil and lymphocyte values, neutrophil/lymphocyte ratio, imaging, and operative and pathological findings for both groups were evaluated.

Results: A significant difference was found between Groups 1 and 2 with respect to leukocyte and neutrophil counts and neutrophil/lymphocyte ratio ($p<0.001$). No statistically significant differences were found for distribution of age, lymphocyte count, and gender. Receiver operating characteristics curve was drawn with existing data for neutrophil/lymphocyte ratio; when we take 3,93 for cut-off value sensitivity was %92.5 and spesifity was %59.3. In pathological evaluation of 43 patients in Group 1, perforated (n=4), gangrenous and phlegmonous (n=36) and acute (n=3) appendicitis were detected.

Conclusion: Preoperatively, the estimated neutrophil/lymphocyte ratio can be accepted as easily available, adjunctive data that contributes to the diagnosis of appendicitis at a lower cost.

Key Words: Aged; Geriatric; Appendicitis; Neutrophils; Leukocytes.

ARAŞTIRMA

GERİATRİK YAŞ GRUBUNDA GÖRÜLEN AKUT APANDİSİT OLGULARINDA NÖTROFİL/LENFOSİT ORANININ TANISAL DEĞERİ

ÖZ

Giriş: Bu çalışmanın amacı, acil tıp kliniğine başvurup akut apandisit tanısı alan geriatrik yaş grubundaki olgularda nötrofil/lenfosit oranının tanısal değerini araştırmaktır.

Gereç ve Yöntem: Ocak 2009–Aralık 2013 yılları arasında, apandisit tanısıyla ameliyat edilmiş, 65 yaş üstü 43 olgunun (Grup 1) ve ameliyat edilmemiş, 81 olgunun (Grup 2, kontrol grubu) hasta dosyaları retrospektif olarak değerlendirildi. Olguların; yaş, cinsiyet, lökosit sayımı, nötrofil değeri, lenfosit değeri, nötrofil lenfosit oranı, görüntüleme bulguları, ameliyat bulguları ve patolojik incelemeleri değerlendirmeye alındı.

Bulgular: Grup 1 ve grup 2 arasında, lökosit sayısı, nötrofil sayısı ve nötrofil / lenfosit oranı açısından anlamlı oranda farklılık olduğu saptandı ($p<0.001$). Yaş, lenfosit sayısı ve cinsiyet dağılımı açısından istatistiki olarak anlamlı fark saptanmadı. Mevcut veriler ile nötrofil / lenfosit oranı için alıcı işletim karakteristiği eğrisi elde edildiğinde; eşik değeri 3.93 olarak alındığında sensitivite %92.5, spesifite %59.3 olarak saptandı. Patolojik değerlendirmede (Grup 1); 4 olguda perfore apandisit, 36 olguda gangrene, flegmone apandisit ve 3 olguda akut apandisit saptandı.

Sonuç: Ameliyat öncesi bakılan nötrofil/lenfosit oranının; apandisit tanısı için, düşük maliyetle ve kolayca elde edilebilecek, değerli bir veri olduğu görülmüştür.

Anahtar Sözcükler: Geriatri; Apandisit; Nötrofil; Lökosit.

Introduction

Acute appendicitis (AA) is the most frequently seen cause of acute abdomen. Its incidence is 7% in all age groups, while the incidence of perforation in patients with a diagnosis of AA ranges from17-20%. Although the mortality rate in the general population is below 1%, with aging (>60 years) its incidence approaches 50% (1-3). Most frequently seen symptoms and signs include leukocytosis and lower abdominal quadrant tenderness.

Despite imaging modalities and highly sensitive laboratory tests introduced into clinical use with developing technology, diagnostic difficulties are still experienced and higher perforation rates are encountered. However, in many published series, higher perforation (15-45%) and negative appendectomy (7-25%) rates demonstrate that despite evolving technological opportunities and clinical experience, a perfect diagnostic method has not yet been developed (4).

In recent years, some researchers have reported on the predictive value of the neutrophil/lymphocyte ratio (NLR) for inflammation, which can be used as a diagnostic parameter in the perioperative diagnosis of AA (5,6,7). Because of the favourable cost-effectiveness of this test, we aimed to investigate the efficacy of NLR in geriatric patients who consulted to the emergency department with a diagnosis of AA.

Materials and Methods

This study was approved by Bagcilar Training and Research Hospital, Clinical Ethics Committees (2014/246, 03.06.2014). The medical files of 43 cases aged over 65 (total N=5000) operated with the diagnosis of AA (Group 1) in the Clinics of General Surgery at our tertiary center between January 2009 and December 2013, and 81 unoperated cases (Group 2; Control Group) who were consulted to the emergency department with complaints of abdominal pain, were evaluated retrospectively.

Age, sex, leukocyte count, neutrophil and lymphocyte values, neutrophil/lymphocyte ratio, imaging, and operative and pathological findings were evaluated. Measurements of leukocyte, neutrophil and lymphocyte values were performed using an automated cell counter. Normal values for leukocyte counts were accepted as 4500-10300/mm^3.

Histopathological examination results were grouped as perforated appendicitis and gangrenous-phlegmenous appendicitis. Patients in Group 1 were operated and after completion of their observation period in the service, they were discharged as cured. Patients evaluated in Group 2 as having no remarkable characteristic findings were discharged from the intensive care unit after regression of clinical findings with medical treatment.

Statistical Analyses

Data were analyzed using the Statistical Package for the Social Sciences 17.0 for Windows (SPSS Inc., Chicago, IL). For categorical data (age, leukocyte value, neutrophil value, lymphocyte value, NLR), Student's t-test was used. Comparison of gender groups was performed using the $^{-2}$ test. In Group 1, NLR subgroups analyses done with Mann Whitney U test. Receiver operating characteristics (ROC) curve was drawn with existing data for NLR. All differences associated with a chance probability of .05 or less were considered statistically significant.

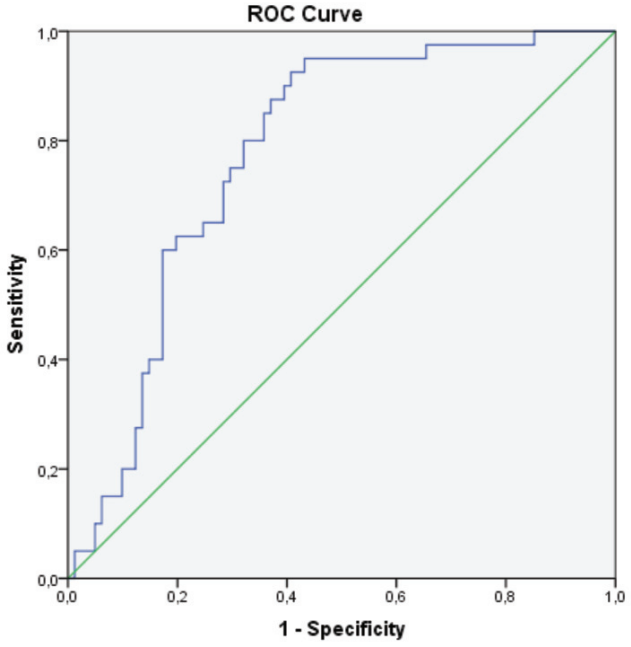
Results

The following parameters were evaluated; mean age, Group 1=73.69±6.99 years and Group 2=75.3±6.48 years; male/female ratio, Group 1=27/16 and Group 2=46/35; leukocyte count, Group 1=13.63±3.46 and Group 2=8.73±3.34 10^3/mm^3; neutrophil count, Group 1, 11.11±3.26 10^3/mm^3 and Group 2, 6.24±3.43 10^3/mm^3; lymphocyte count, 1.49±0.95 10^3/mm^3 and Group 2, 1.71±0.75 10^3/mm^3; NLR, Group 1, 10.15±6.7 and Group 2, 5.78±6.99 (Table 1).

Table 1— Demographic and Hematological Data (Leukocyte, Neutrophil and Lymphocyte Counts) and Neutrophil/Lymphocyte Ratio in Groups 1 and 2.

	Group 1	Group 2	p
Age (years)	73.69 ± 6.99	75.3 ± 6.48	NS
Sex (Female/Male ratio)	27/16	46/35	NS
Leukocyte count (10^3/mm^3)	13.63 ± 3.46	8.73 ± 3.34	<0.001
Neutrophil count (10^3/mm^3)	11.11 ± 3.26	6.24 ± 3.43	<0.001
Lymphocyte count (10^3/mm^3)	1.49 ± 0.95	1.71 ± 0.75	NS
Neutrophil/lymphocyte ratio	10.15 ± 6.7	5.78 ± 6.99	<0.001

NS= Non-significant



Area under the curve; area: 0.776, std.error: 0.043, asymptotic sig.: 0.000

Figure 1— ROC curve for NLR.

Significant differences were found between Groups 1 and 2 for leukocyte and neutrophil counts and NLR ($p<0.001$). No statistically significant differences were found for distribution of age, lymphocyte count, and gender.

ROC curve was drawn with existing data for NLR; when we take 3.93 for cut-off value sensitivity was %92.5 and specificity was %59.3 (Figure 1), when cut-off value was 4.51 sensitivity %87.5 and specificity %63, when cut-off value was 4.64 sensitivity %85 specificity %64.2 calculated (Table 2).

All patients aged over 65 who consulted to the intensive care unit with complaints of abdominal pain underwent whole abdominal ultrasonographic (US) and oral-intravenous-rectal contrast-enhanced whole abdominal computed-tomographic (CT) examinations. During radiological evaluation, an appendiceal diameter of more than 7 mm and presence of comorbidities (fluid collection, abscess, mesenteric contamination and free air) were accepted as positive findings suggestive of the presence of AA. In 10 cases evaluated by US in Group 1, appendiceal diameters were above 7 mm, and in the other cases appendices could not be visualized. On the computed-tomograms, appendiceal diameters were >7 mm (n=32), <7 mm (n=32), and in two cases concomitant pathologies were detected. In Group 2, US and CT imaging modalities did not reveal any findings that could explain the underlying pathology of the abdominal pain.

Table 2— Cut-off, Sensitivity, Specifity Values of NLR for ROC Curve.

Cut-off value	Sensitivity	Specificity	Sens. x Spes.
3.93	92.50	59.30	0.55
4.51	87.50	63.00	0.55
4.64	85.00	64.20	0.55

In the pathological evaluation of the 43 patients in Group 1, perforated (n=4), gangrenous and phlegmonous (n=36) and acute (n=3) appendicitis were detected.

Discussion

"Acute abdomen" is frequently encountered in intensive care units and despite developments in diagnostic and therapeutic methods, it still presents as a serious problem. It is not always possible for a surgeon to diagnose and treat a case of acute abdomen properly. AA is the most frequently seen etiological factor for acute abdomen. In infants, its incidence is relatively low, while it increases during childhood and reaches its maximum between 10 and 30 years of age. In all age groups its incidence is 7%, while perforation is seen in 17-20% of these cases (8).

In acute but uncomplicated cases of appendicitis, the patients usually present with leucocyte counts between 10000-18000/mm^3 and occasionally with moderate dominancy of polymorphonuclear leucocytosis (left shift). If white blood cell counts are within normal limits without left shift, then a diagnosis of acute appendicitis should be reconsidered. In uncomplicated cases of appendicitis, white blood cell counts (WBCs) rarely exceed 18000 /mm^3. If WBCs are above this level, then a perforated appendicitis or appendiceal abscess should be considered (8). In our study, whole blood cell counts were detected as follows: leukocyte count, Group 1=13.63±3.46 10^3/mm^3 and Group 2: 8.73±3.34 10^3/mm^3 ; neutrophil count, Group 1=11.11±3.26 and Group 2: 6.24±3.43 10^3/mm^3; and lymphocyte count, Group 1=1.49±0.95 10^3/mm^3 and Group 2=1.71±0.75 10^3/mm^3.

AA causes higher mortality rates in the elderly than in younger patients. Delay in diagnosis and treatment, and con-

comitant diseases, may be responsible for higher mortality rates in the elderly. The most important reason is delayed treatment. Classical signs in the elderly may not be so obvious. Signs on physical examination are usually very subtle. Abdominal distension is often seen. In 30% of elderly patients with AA, appendiceal perforation is detected intraoperatively. The most important factor in the development of perforation is delay in diagnosis and referral to a physician. Therefore in cases with presumptive AA, early surgical treatment is advised (9).

Acute appendicitis is likely to be an everyday occurrence in emergency units. Especially in rural areas, surgeons may not have imaging facilities. Further, the presence of ultrasonography or computed tomography imaging may not help in achieving an accurate diagnosis (10).

A study by Yazıcı et al. revealed that an NLR >3.5 has maximum sensitivity. They also indicated that higher N/L ratios have increased specificity and positive predictive value, while the most valuable results were obtained at NLR >5 (7). In 2014, Kahramanca et al. published a study that compared normal appendices with inflamed appendices and estimated the cut-off value of NLR as 4.68 (10). In complicated appendicitis, the cut-off value for NLR was estimated as 5.74, with a 70.8% sensitivity and 48.5% specificity. In limited number of published studies, a higher diagnostic value of NLR relative to conventional laboratory evaluations (leukocyte counts, C-reactive protein) has been indicated. In a study by Kahramanca et al., the researchers detected a diagnostic significance of NLR >4.68 for acute and NLR >5.74 for uncomplicated AA. However, normal ranges of NLR do not rule out a potential diagnosis of AA (10). Though in some publications higher cut-off values have been indicated, Ishizuka et al. detected a lower cut-off value for NLR. Ishizuka et al. reported a cut-off value for NLR of 8 in the differential diagnosis of gangrenous appendicitis (11).

In our study, NLR was found to be 10.15±6.7 and 5.78±6.99 in Groups 1 and 2, respectively. ROC curve for NLR; when we take 3.93 for cut-off value sensitivity was %92.5 and specificity was %59.3, when cut-off value was 4.51 sensitivity %87.5 and specificity %63, when cut-off value was 4.64 sensitivity %85 specificity %64.2 calculated. As it seen when cut-off value gets smaller it is more efficient to diagnose AA, when cut-off value gets bigger it is more efficient to diagnose nonsick patients. In our study 3.93 value has maximum sensitivity.

The usefulness of imaging techniques in the diagnosis of AA has been objectively demonstrated. However, the cost of imaging modalities apart from ultrasound and the excessive operator-dependent characteristics of ultrasound and its requirement for experience create difficulties. The reliability of ultrasound reportedly ranges between 71 and 95 percent (12). However, it has been recognized that overemphasizing the diagnostic value of ultrasound leads to an increase in the number of negative laparotomies, and it should not override clinical symptoms that are more valuable in the diagnosis of AA (13). In our study, in Group 1, the diameters of appendices were more than 7 mm as evaluated by ultrasonographic (US) examinations in 10 cases; in the other cases the appendices could not be visualized.

In a study by Kum et al., the authors found that appendectomies were performed on patients with normal (14%), inflammatory (70%) and perforated (16%) appendices (14). In our study, we found perforated (n=4), gangrenous and phlegmonous (n=36) and AA (n=3).

In the case of delayed intervention, clinical manifestations of simple appendicitis result in perforation, and the delay increases rates of mortality and morbidity. Therefore, the overall tendency in surgical clinics is to operate the patient before establishing signs and symptoms. For that reason, decisions to operate result in the removal of normally appearing appendices in 15-30% of cases. Increased rates of negative laparotomy can be reduced with an increase in the observation period; however, this can result in the development of a perforation, which can increase morbidity and mortality rates. The use of adjunctive diagnostic methods might decrease the number of unnecessary operations, perforation rates and length of hospital stay (15,16).

When compared with the last century, a pronounced drop in morbidity and mortality can be seen to stem from an aggressive surgical strategy. Consequently, negative appendectomy rates approaching 30% are generally accepted all over the world (17). As the negative appendectomy rates increase, perforation rates decrease proportionally. The mean perforation rate is 3.6% in young men and higher in children and the elderly (18).

In conclusion, frequently used laboratory tests do not suffice to establish a definite diagnosis of AA in cases over 65 years of age. Preoperatively estimated NLR can be accepted as easily available, adjunctive data with a lower cost, contributing to the diagnosis of AA.

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Mehmet CAVLAK[1]
Aysun ODABAŞI BALSEVEN[2]
Ramazan AKÇAN[2]
Mahmut Şerif YILDIRIM[2]
Aykut LALE[2]
Eyüp Ruşen HEYBET[2]
Ali Rıza TÜMER[2]

İletişim *(Correspondance)*

Mehmet CAVLAK
Council of Forensic Medicine, Ankara Group Authority, Morgue Department ANKARA

Tlf: 0505 468 30 70
e-posta: drmehmetcavlak@hotmail.com

Geliş Tarihi: 20/08/2014
(Received)

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(Accepted)

[1] Council of Forensic Medicine, Ankara Group Authority, Morgue Department ANKARA
[2] Hacettepe University, Faculty of Medicine, Department of Forensic Medicine ANKARA

RESEARCH

ASSESSMENT OF LEGAL CAPACITY IN THE GERIATRIC POPULATION: A RETROSPECTIVE STUDY

ABSTRACT

Introduction: Today the number of applications for legal guardianship has increased among geriatrics. In Turkey, the assessment of legal guardianship is made within the framework of the 405th and 408th articles of the Turkish Civil Code. To the best of our knowledge, there are no published articles dealing with reports of legal guardianship for geriatric citizens. Therefore we aimed to evaluate legal guardianship reports in light of the related literature.

Materials and Method: The records of the Department of Forensic Medicine of Hacettepe University Medical Faculty were used in this study. Patients' files and legal guardianship reports issued between the years 2011 and 2013 were investigated retrospectively. Geriatric cases (aged over 65) that had been referred for a legal capacity evaluation were included in the study. All cases were analyzed in terms of age, sex, occupation, existing psychiatric disorder or illnesses, the reason for legal guardianship, Mini Mental State Examination Test score and presence of dementia.

Results: Of a total of 1306 cases, 36 (2.7%) were elderly patients referred for a legal guardianship examination. The ages of these cases ranged between 65 and 90. Sixty-one percent of the cases were evaluated in terms of TCC article 405 and 14% in terms of article 408. Of the total elderly cases, 81% (n=29) suffered from dementia, which in turn was due to Alzheimer's disease in 83% of the dementia cases.

Conclusion: Our findings revealed that the most common medical condition requiring legal guardianship was dementia, of which the leading cause was Alzheimer's disease.

Key Words: Geriatrics; Legal Guardians/Legislation & Jurisprudence; Mental Competency/Legislation & Jurisprudence; Dementia.

ARAŞTIRMA

GERİATRİK POPÜLASYONDA HUKUKİ EHLİYETİN DEĞERLENDİRMESİ: RETROSPEKTİF ÇALIŞMA

ÖZ

Giriş: Günümüzde geriatrik popülasyonda vasi tayini için yapılan başvurular artmıştır. Ülkemizde vasi tayini değerlendirmeleri Türk Medeni Kanunu 405 ve 408. maddeleri çerçevesinde yapılmaktadır. Yapılan literatür taramasında geriatrik yaş grubunda vasi tayini raporlarını irdeleyen bir çalışmaya rastlanılmamıştır. Bu nedenle vasi tayini raporlarını literatür verileri ışığında değerlendirilmesi amaçlanmıştır.

Gereç ve Yöntem: Hacettepe Üniversitesi Tıp Fakültesi Adli Tıp Anabilim Dalı'nın kayıtları kullanılmıştır. 2011-2013 yılları arasındaki hasta dosyaları ve verilen vasi tayini raporları retrospektif olarak incelenmiştir. Bütün olgular gönderilen 65 yaş üstü olgular hakkında düzenlenmiş raporlar yaş, cinsiyet, yaşadığı kişiler, meslek, mevcut hastalıkları, psikiyatrik bozukluğu olup olmadığı, vasi tayini gerekçesi, Mini Mental Durum Değerlendirme Testi puanı ve demans varlığı açısından değerlendirilmiştir.

Bulgular: İncelenen 1306 olgudan 36 (%2.7) olgunun vasi tayini için gönderilen yaşlı olgular olduğu belirlenmiştir. Bu olguların yaşları 65-90 aralığındadır. Olguların %61'inin TMK'nun 405. maddesi kapsamında, %14 olgunun da 408. Madde kapsamında değerlendirilmiştir. Olguların %81'inde (n=29) demans varlığı tespit edilmiştir. Demansın da %83 Alzheimer'dan kaynaklandığı belirlenmiştir.

Sonuç: Elde edilen bulgular vasi tayinini gerektiren tıbbi durumun en sıklıkla demans olduğunu, bunun da en fazla oranda Alzheimer hastalığından kaynaklandığını ortaya koymuştur.

Anahtar Sözcükler: Geriatri; Hukuki Ehliyet/Mevzuat ve İçtihat; Demans.

Introduction

With advances in treatment and rehabilitative healthcare, the average lifespan, and more importantly, the quality of life of people has improved. Therefore, a greater number of elderly people are now involved in an active life and commercial activities (1,2). In this context, the presence of diseases affecting cognitive capacity, such as dementia, poses significant problems in terms of legal transactions.

Dementia arises from impaired cognitive functions due to impairment in the brain cells or communication among these cells as a result of several diseases or conditions (3). The most common form of dementia is caused by Alzheimer's disease (4). It is reported that one out of every nine people (11%) over the age of 65 and one out of every three people (32%) over the age of 85 has Alzheimer's disease in the USA. Dementia develops in an average of 60-80% of these patients (5). Since a person with dementia becomes deprived of the mental capacity to protect his/her own interests in official transactions such as banking operations and merchandise transactions in daily life, there are risks for this person in making unconscious decisions against him/herself and in being exposed to abuse; therefore, s/he requires legal protection. This is achieved in practice by the appointment of a legal representative who can be a guardian, a curator, or a legal advisor.

Guardianship is the restriction of legal capacity through a legal representative for the purpose of protecting all interests of a person with regard to his/her personality and assets, and representing him/her in legal transactions. Guardianship is assigned ex officio for those who are under age as specified by the civil code, those who have mental illness or defect, and those who lead themselves or their family into poverty due to a harmful lifestyle and bad habits. Guardianship can also be assigned at a person's own request for people who can prove that they cannot duly manage their activities due to old age, inexperience, or severe diseases (6).

The appointment of a guardian may be required due to Alzheimer's, dementia, or psychiatric diseases, but the need for guardianship may also occur when the capacity to act is no longer present, as in the case of organic brain damage due to disease or trauma.

The appointment of a guardian for a person is conducted in accordance with Turkish Civil Code (TCC) Articles 405 and 408 (6). Article 405 of this law states: "Every adult who cannot conduct his duties or requires constant assistance for protection or care, or endangers the safety of others due to mental illness or defectiveness is restricted." Article 408 states: "Every adult who proves that he/she cannot duly manage his activities due to old age, disability, inexperience, or severe diseases may require restriction." The first of these articles prescribes restriction regardless of the person's request, whereas the second article requires the request of the person.

In the literature review, no studies were found that assess the appointment of guardianship/legal capacity within Articles 405 and 408 of the TCC in the geriatric population. Since geriatric patients are known to be more involved in an active life due to the currently increasing lifespan, the present study aimed to explore the significance of capacity assessments and the conditions for removing the capacity to act for cases in this age group who have had reports issued by the Department of Forensics concerning the appointment of a guardian.

Materials and Method

The present study employed polyclinic data from the Department of Forensics, Faculty of Medicine, Hacettepe University; files from the archives of the Department Polyclinic dated from January 1, 2011 to December 31, 2013 were retrospectively reviewed. Ethics committee approval was obtained from Non-interventional Clinical Researches Ethics Board, Hacettepe University (05.06.2014/16969557-615). The present study included patients over the age of 65 (n=36), who were referred by the Civil Courts of Peace for an assessment as to whether the appointment of a guardian was required within TCC Articles 405 or 408. The cases were evaluated for sociodemographic characteristics, reasons for admission, psychiatric diagnoses, and existing diseases. Assessment report results and findings are discussed below, in the context of the literature.

Results

Thirty-six (2.7%) of 1306 reports issued between 2011 and 2013 in the Department of Forensics, Faculty of Medicine, Hacettepe University included patients over the age of 65 who were sent for the appointment of a guardian. Twenty (56%) of these patients were male and 16 (44%) were female. The age of the patients was between 65 and 90 and the mean age was 78.7; the distribution of ages is presented in Table 1. In the assessment reports of the cases included in the present study, it was concluded that all of the patients required the appointment of a guardian. It was also conclud-

Table 1— Sociodemographic Data.

Characteristics	n	%
Age		
65-74	6	17.0
75-84	25	69.0
≥85	5	14.0
Sex		
Male	20	56.0
Female	16	44.0
Living with		
Children	16	44.0
Husband/wife and children	12	34.0
Alone	4	11.0
Other (nursing home, relative, unknown)	4	11.0
Occupation		
Housewife	16	44.0
Retired	14	39.0
Other	6	17.0
Total	**36**	**100.0**

Table 2— Medical Condition.

Condition (n=36)	n	%
Alzheimer's disease	24	67.0
Cerebrovascular diseases	19	53.0
Psychiatric disorder	13	36.0
Depression	6	46.0
Anxiety	3	23.0
Delirium	2	15.0
Psychosis	1	8.0
Bipolar affective disorder	1	8.0
Hypertension	11	31.0
Parkinson	5	14.0
Osteoporosis	4	11.0
Chronic kidney failure	2	6.0
Diabetes mellitus	2	6.0
Glioblastoma multiforme	1	3.0
Creutzfeldt-Jakob disease	1	3.0
Hydrocephaua	1	3.0

ed that among these patients, 22 (61%) patients required guardianship pursuant to TCC Article 405 and five (14%) patients required guardianship pursuant to Article 408. Nine (25%) patients could not have a mental health assessment since they were in an intensive care unit, or were unconscious or aphasic patients. The appointment of guardianship as per Article 408 could not be recommended since the patients did not have the ability to make their own requests due to impaired consciousness. Further, the appointment of guardianship as per Article 405 could not be conducted due to the lack of a mental health assessment in this patient group; however, the medical conditions of the patients were clearly specified and the need of the patients for the a guardian was indicated irrespective of the two civil code articles. Two patients had previous reports on the same matter and their status of guardianship had not change with their most recent assessments. Fifteen patients were given a Mini Mental State Examination Test (MMSE), and their scores ranged from 7-24 points, with a mean score of 13.5. Of the patients, 44% were living with their children, 34% were living with their spouses and children, and 11% were living alone. With respect to occupations, 44% were housewives (all of the female patients) and 39% were retired. All of the patients except for two (34 patients, or 94%) had multiple diseases. The most common disease was Alzheimer's (67%). This was followed by cerebrovascular disease (CVD, 53%), hypertension (31%), and Parkinson's disease (14%). Psychiatric diseases were identified in 36% (n=13) of patients, and the most common disease among these patients was depression (46%). Of the reasons for the appointment of guardianship, 58% (n=21) were non-organic or psychiatric, whereas the remainder were due to organic causes. Eighty-one percent of the patients (n=29) had dementia: 24% of these cases were due to Alzheimer's, 14% were due to Parkinson's, and 3% were due to both diseases.

Discussion

Impaired mental functions may occur in the geriatric population due to factors such as old age, disease, or trauma. The will of these people is consequently restricted and their capacity to make healthy decisions in legal transactions is reduced. They require protection through a legal representative (guardian, curator, or legal advisor). The assessments for the appointment of a guardian reviewed in the present study were made within the framework of TCC Articles 405 and 408 in Turkey.

Article 405 states: "Every adult who cannot perform his/her duties or requires constant assistance for protection or care, or endangers the safety of others due to mental illness or defectiveness is restricted" (6). As per the terms of this article,

Table 3— Appointment of Guardianship Data.

Characteristics	n	%
Reason for Appointment of Guardianship		
TCC 405	22	61.0
TCC 408	5	14.0
State of consciousness can not be evaluated due to lack of communication	9	25.0
Mini Mental State Examination Score	16	44.0
0-9	3	19.0
10-19	11	69.0
20-30	2	13.0
The presence of dementia	29	81.0
Alzheimer's dementia	24	83.0
Parkinson's dementia	4	14.0
Alzheimer's and Parkinson's dementia	1	3.0

an assessment of the person's capacity is made, and a guardian is appointed when considered necessary.

Article 408 of the same law states: "Every adult who proves that he/she cannot duly manage his/her activities due to old age, disability, inexperience, or severe diseases may require restriction" (6). This Article differs from Article 405 in that the requirement for a restriction is at the person's own request.

The present study evaluated patients referred for the appointment of a guardian to the Department of Forensics, Faculty of Medicine, Hacettepe University between 2011 and 2013. Thirty-six (2.7%) of 1306 reports were for patients over the age of 65. A study that evaluated patients referred to the Forensic Psychiatry Unit, Faculty of Medicine, Gaziantep University, reported that 150 of 314 patients admitted during the three-year investigation were referred within the scope of the civil code and 118 of these patients (37.6% of all patients) were referred for an assessment for guardianship (7).

In forensic psychiatry, the parameters of a mental state assessment have been established as a psychiatric examination supported by psychometric tests, and by other tests when considered necessary. Many tests can be used for these assessments, such as the MMSET, the Legal Capacity Assessment Form (HEDEF), the MacArthur Competence Assessment Tools for Clinical Research, the Clinical Interview Scale for Financial Capacity, the Wechsler Memory Scale – Revised, and the Neuropsychological Test Battery for Cognitive Potentials (BILNOT) (8, 9, 10, 11).

The MMSET is the most commonly used test to assess cognitive impairment in the elderly (12, 13). This test evaluates the basic cognitive skills of the person such as short term memory, distant memory, orientation, writing, and linguistic skills. In the MMSET, a score of 26-30 points is considered normal, 20-25 points is considered mild cognitive impairment, 10-20 points is considered moderate cognitive impairment, and 0-9 points suggest severe cognitive impairment (14). Pachet et al. have also suggested that the decision of the legal representative is more important in the decision-making process for individuals with ≤ 19 points, whereas the decision of the person has a greater role for people with ≥20 points (15). This test had been administered to sixteen of the patients in the present study. Of the patients who had this test, 88% (n=14) had a score ≤ 19 points and the remaining two patients had scores of ≥20 points. Gungen et al. reported that the MMSET was an appropriate and reliable test for the diagnosis of dementia in the Turkish population, and the threshold of the test for a diagnosis of normal functioning was 23/24 points (16). One of our two patients who had ≥20 points had 20 points and the other had 24 points; both patients had dementia.

Eighty-one percent of the patients in our study (n=29) were diagnosed with dementia. With this ratio, dementia was prominent as the reason they had been placed under guardianship. Of these, the dementia was caused by Alzheimer's disease in 83% (n=24) and by Parkinson's disease in 14% (n=4); one patient had both Alzheimer's and Parkinson's. It has been reported that approximately one out of every nine people (11%) over the age of 65 and one out of every three people (32%) over the age of 85 has Alzheimer's disease in the USA. A study conducted in Istanbul found that the incidence of Alzheimer's disease was 11% among people over the age of 70 (17). A study with 490 people over the age of 65 in Izmir found the prevalence of dementia to be 12.9% (18). Dementia develops in an average of 60-80% of patients with Alzheimer's disease (5). The risk for developing Alzheimer's disease over the age of 60 doubles every five years (19). Of 24 patients with Alzheimer's disease in our study, one was in the age range of 65-74, 18 were in the age range of 75-84, and five were over the age of 85. As a result, 17% of the patients from the 65-74 age group, 72% of the patients from the 75-84 age group, and all of the patients over the age of 85 had Alzheimer's disease and, accordingly, dementia. When evaluated based on age group, the incidence of Alzheimer's disease increased incrementally with increasing age, which is consistent with the literature. The classification of patients in the

present study based on age distribution is presented in Table 1.

Forgetfulness and learning disabilities are at the forefront in early Alzheimer's disease, whereas the cognitive functions of the person are maintained (20). In this stage, the person has still insight, so these changes in mental state and/or neurophysiological changes in the central nervous system may cause depression. Both the still unsettled symptoms of the disease and the person's ability to maintain his/her daily life without any assistance from others may cause the symptoms of early Alzheimer's disease to be explained by a diagnosis of depression. Additionally, the mild symptoms of the disease in its early stage and the still non-impaired functionality also prevent family members and attendants at institutions, such as notaries and marriage registry officers, who are not healthcare professionals, from suspecting these people and requesting a capacity report. For these reasons, it can be seen that those in the early stage of Alzheimer's disease appear less frequently in applications for the appointment of a guardian. We also suspect that this is the reason why all of the Alzheimer patients in the current study group who had been assessed for guardianship were at a moderate or advanced stage of the disease, and all had dementia.

One meta-analysis that evaluated the incidence and prevalence of studies on Parkinson's disease in European countries reported that the incidence of this disease in people over the age of 65 varied from 1.28% to 1.5% (21), and another analysis reported an incidence of 1.8% (22). Further, dementia was reported in an average of 10-30% of patients with Parkinson's disease (23, 24). Of the patients included in the present study, 14% had Parkinson's disease, and 3% had both Alzheimer's and Parkinson's disease; all of these patients had dementia and the dementia was considered to have resulted from these diseases.

With respect to patients with CVD, risk factors for dementia include hypertension and advanced age (25). Of the CVD patients included in the present study, 74% were over the age of 75, and 32% had hypertension.

Nine patients in the present group had such severe cognitive impairment that the mental health assessment could not be completed, and a report within Article 405 could not be issued for these patients. However, the records indicated that guardianship was required by specifying the person's current clinical conditions, the characteristics of his/her diseases and need for care; it was further stated that, on a case-by-case basis, the requirement for guardianship would be reconsidered after the completion of treatment. Patients were examined during their stay in clinical or intensive care units.

For all of the patients in the present study, consultation was requested from the departments of neurology and/or psychiatry, and a detailed and systematic assessment was conducted. Neuropsychological tests were administered to the patients in addition to the forensic psychiatric and clinical assessments.

In cases where a person's mental capacity is in doubt, notaries, real estate registration offices, and marriage registry offices can request that an appropriate health institution issue a report on whether the person has the capacity to act. In such cases, a single physician may suggest an opinion within a report. However, these reports are valid only for the day of the transaction and do not have continuity. On the other hand, the authority for guardianship lies in the civil court of peace, as per the law, and these courts request an assessment of these people within the scope of TCC Articles 405 and 408 in order to appoint a guardian under TCC. As a result of the assessments made in this regard, 61% of the patients included in the present study were deemed suitable for guardianship pursuant to Article 405 and 19% were suitable pursuant to Article 408. An assessment of the remaining 19% of patients could not be made within the scope of these articles for various reasons, including being unconscious and being unable to speak. Nevertheless, decisions were made in favor of guardianship for these patients upon evaluation of their medical conditions, the diagnoses of their diseases, and whether there was a need for constant care in combination with the current examination results.

With the increase in average lifetime, the involvement of the geriatric population in having an active life and in commercial activities has also increased. Given the increased incidence of some diseases in this population, such as dementia, the significance of legal capacity assessments has also increased (2). Impaired cognitive functions and the onset of dementia in particular, affect an individual's capacity to act and sometimes completely remove this capacity. The assessment of the capacity to act in patients with suspected dementia, especially in the geriatric age group, should be made by experienced physicians who have expertise in the subject, and the significance of this decision for the person's transactions should be taken into consideration. The family and, when appropriate, the said persons, should be informed about the onset of dementia, especially with progressive causes of dementia such as Alzheimer's disease; they should be advised that re-assessment is required from time to time for the protection of personal rights, even though guardianship is not necessary in the initial phase of Alzheimer's disease. The

appointment of a legal consultant should be recommended if required.

In acute cases such as CVD, which especially affects consciousness in the elderly, the person's banking and merchandise transactions and even some activities related to his/her own treatment may be interrupted. In such cases, the course of the acute disease, which can affect consciousness, as well as the person's medical condition after treatment, becomes uncertain when the person's age and the comorbid diseases are also added to the situation. This leads family members to request the appointment of a guardian for the aforementioned transactions. In this study, we found that nine patients referred by the courts who were unconscious or aphasic during the assessment, due to diseases such as CVD that directly affect the central nervous system, did not fall under the scope of either Article 405 or Article 408 of the civil code; however, guardianship was recommended because of the patient's condition. The articles within the civil code with regard to the appointment of guardians should be revised so that it will cover such patients.

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Şahin KAHRAMANCA[1]
Oskay KAYA[2]
Hakan GÜZEL[2]
Bülent Çağlar BİLGİN[3]
Tezcan AKIN[4]
Gülay ÖZGEHAN[2]
Bertan KÜÇÜK[5]
Hülagü KARGICI[2]

RESEARCH

CORRELATIONS OF HISTOPATHOLOGICAL FEATURES WITH AXILLARY LYMPH NODE INVASION AMONG PATIENTS WITH BREAST CANCER IN GERIATRIC AND NON-GERIATRIC POPULATIONS

ABSTRACT

Introduction: In this study, it was aimed to investigate the relationships between immunohistochemical parameters and axillary lymph node metastasis in female patients with breast cancer. Additionally, age related differences between patient groups were investigated.

Materials and Method: Medical records of patients who underwent surgery for breast cancer during the last ten years were evaluated. The patients were divided into two groups according to their age: above group 1and below group 2, 65 years. Patient age, tumor stage, estrogenic and progesterone receptor status, C-erbB-2 oncogene and p53 tumor suppressor gene status and axillary lymph node status were recorded and analyzed for both groups.

Results: There were 43 patients with a mean age of 72 in G1 and 148 patients with a mean age of 48 in G2. We detected a positive correlation between axillary lymph node metastasis and p53 mutation for all patients, and this correlation was statistically significant in G2 ($p<0.001$). Different correlations however not statistically significant were observed between the other immunohistochemical parameters and axillary lymph node metastasis.

Conclusion: Immunohistochemical parameters, particularly p53 mutation, may indicate axillary lymph node metastasis and tumor prognosis in patients with breast cancer.

Key Words: Breast Neoplasms; Geriatrics; Pathology; Lymphatic Metastasis.

ARAŞTIRMA

MEME KANSERLİ YAŞLI VE GENÇ HASTALARDA HİSTOPATOLOJİK ÖZELLİKLER VE BUNLARIN KOLTUK ALTI LENF BEZİ TUTULUMU İLE İLİŞKİSİ

ÖZ

Giriş: Bu çalışmada, meme kanserli hastalarda immunhistokimyasal parametreler ile aksiller lenf nodu metastazı arasındaki ilişkinin araştırılması amaçlanmıştır. Aynı zamanda hasta grupları arasında yaşa bağlı olabilecek farklılıkları da araştırılmıştır.

Gereç ve Yöntem: Son 10 yıl içinde meme kanseri nedeniyle ameliyat edilen hastalara ait dosyalar incelendi. Hastalar 65 yaş ve üstünde olanlar grup 1ile 65 yaşın altında olanlar grup 2 şeklinde iki gruba ayrıldı. Hasta yaşı, cinsiyeti, tümör evresi, östrojen ve progesteron reseptör durumu, C-erbB-2 onkogen ve p53 tümör baskılayıcı gen durumu, aksiller lenf nodu tutulumu her iki grup için de kayıt edilip değerlendirildi.

Bulgular: G1 de yaş ortalaması 72 olan 43 hasta, G2 de ise yaş ortalaması 48 olan 148 hasta vardı. Aksiller lenf nodu metastazı ile p53 mutasyonu arasında tüm hastalar için pozitif bir korelasyon saptadık ve bu korelasyon G2 için istatistiksel olarak anlamlı idi ($p<0.001$). Diğer immunhistokimyasal parametreler ile aksiller lenf nodu durumu arasında istatistiksel olarak anlamlı olmayan farklı korelasyonlar vardı.

Sonuç: İmmunhistokimyasal parametreler ve özellikle p53 mutasyonu meme kanserli hastalarda aksiller lenf nodu metastazı ve dolayısı ile de tümör prognozunda belirleyici olabilir.

Anahtar Sözcükler: Meme Kanseri; Geriatri; Patoloji; Lenfatik Metastaz.

İletişim *(Correspondance)*

Şahin KAHRAMANCA
Kars Devlet Hastanesi Genel Cerrahi Kliniği KARS

Tlf: 0312 596 23 14
e-posta: drkahramancasahin@gmail.com

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[1] Kars Devlet Hastanesi Genel Cerrahi Kliniği KARS
[2] Dışkapı Yıldırım Beyazıt Eğitim ve Araştırma Hastanesi Genel Cerrahi Kliniği ANKARA
[3] Kafkas Üniversitesi Tıp Fakültesi Genel Cerrahi Anabilim Dalı KARS
[4] Numune Eğitim ve Araştırma Hastanesi Genel Cerrahi Kliniği ANKARA
[5] Özel Melikgazi Hastanesi Genel Cerrahi Bölümü KAYSERİ

Introduction

Excluding skin cancers, breast cancer is the most common cancer diagnosed among women, accounting for nearly one-third of all female. Breast cancer is also the second leading cause of cancer death among women after lung cancer (1). The incidence of breast cancer has also increased in Turkey, and the estimated number of breast cancer cases was 44,253 in 2007 (2). According the statistical data of Ministry of Health breast cancer was the most common type of female cancer in the first 10 ranks with 40.6 percentages in 2009 (3). Breast cancer risk increases with increasing age (1,2). The lifetime risk for breast cancer has increased due to a longer life expectancy. In the United States, nearly 99,220 new invasive breast cancer cases were reported in patients 65 years and older in 2013. This number corresponded to 42.7 percent of breast cancer for all age groups (1). In this study, we aimed to compare estrogene (ER) and progesterone receptor (PR) status, C-erbB-2 oncogene positivity, p53 tumor suppressor gene status and axillary lymph node (ALN) invasion degree in geriatric and non-geriatric patient groups.

Materials and Method

Participants and Study Design

After the approval of the local institution's ethics committee, a retrospective study was designed based on the hospital database. The files of patients who were diagnosed with breast cancer between January 2005 and January 2014 were scanned. These patients had been diagnosed preoperatively via needle, incisional or excisional biopsy, or had undergone surgery for an unknown breast mass and were diagnosed by frozen section. None of the patients had received neoadjuvant therapy. The surgical procedure for all patients was modified radical mastectomy (MRM), and histopathological records of the mastectomy and axillary dissection materials were investigated. Initially, 213 patient files obtained from one training and research hospital, one state hospital and one private hospital were reviewed, 22 patients were excluded due to missing data in the files, male gender, treatment with neoadjuvant therapy or alternative surgical procedure. Thus, 191 patients were included in the study. Patients for whom age, gender, stage according to the TNM scoring system (i.e., T: Tumor, N: Lymph node or M: Metastasis, according to the Union for International Cancer Control (UICC) and the American Joint Committee on Cancer (AJCC), (7th Edition)), and ER, PR, C-erbB-2 oncogene and p53 tumor suppressor gene status were available were enrolled in the study. Immunohistopathological findings were compared with axillary lymph node status. All patients were female. The patients were divided into two groups according to age: 65 years or above (i.e., G1: group 1 or geriatric group) and below 65 years (i.e., G2: group 2 or non-geriatric group).

Statistical Analysis

Data analysis was performed using SPSS 22 for Windows (Chicago, IL, USA). The Levene test was used to evaluate homogeneity of variances. The data were presented as mean ± standard deviation or median (min–max), where applicable. Differences between groups were compared using Student's t-test or the Mann–Whitney U test, where appropriate. Categorical data were analyzed using the Pearson chi-square test, where appropriate. A p-value of less than 0.05 was considered statistically significant.

Results

A total of 191 patients were included in the study, with a median age of 51 (27-88) years. Forty-three (22.5%) patients were included in G1, and 148 (77.5%) patients were included in G2. All patients had undergone MRM surgery. Tumors were located in the right breast in 103 cases and in the left breast in 88 cases. Infiltrative ductal carcinoma was the unique histopathological cancer type in all cases. According to the histopathological TNM staging system, the majority of patients were in stage 2a (51 cases, 26.7%). Each of 102 patients had at least one ALN metastasis (N1). These findings are summarized in Table 1 and Table 2. The results of

Table 1— Histopathological Details for All Patients.

		n (%)
Histopathological Stage (TNM)*	DCIS**	3 (1.6)
	Stage 1	50 (26.2)
	Stage 2a	51 (26.7)
	Stage 2b	42 (22.0)
	Stage 3a	29(15.2)
	Stage 3b	4 (2.1)
	Stage 3c	11 (5.8)
	Stage 4	1 (0.4)
Lymph Node Metastasis*	N0	89 (46.6)
	N1	102 (53.4)

*T: Tumour N: Lymph node M: Metastasis According to Union for International Cancer Control - UICC and American Joint Committee on Cancer - AJCC , 7th Edition

**Ductal carcinoma in situ.

Table 2— The Between-Groups Comparisons of Demographic Characteristics and Lymph Node Status.

	Group 1	Group 2	Total
Patient number	43	148	191
Mean age (year)	71.9±5.6	47.4±8.6	52.9±13.0
Lymph node metastasis	25	77	102

Group 1: Geriatric population, Group 2: Non-geriatric population.

immunohistochemical staining for ER, PR, C-erbB-2 and p53 status were compared to histopathological ALN metastasis. No significant relationship was observed between the immunohistochemical parameters and ALN metastasis in the geriatric patient group. A significant positive relationship was observed between p53 mutation and ALN invasion in the non-geriatric group ($p<0.001$) (Table 3). An analysis of the correlations between the number of metastatic ALNs and the immunohistochemical parameters revealed different results in the two groups. In G1, negative correlations existed between C-erbB-2 and ALN invasion and between PR positivity and ALN invasion. However, in the same group, positive correlations were observed between p53 mutation and ALN invasion and ER positivity and ALN invasion. However, in the same group, positive correlations were observed between p53 mutation and ALN invasion and ER positivity and ALN invasion. In contrast, in G2, negative correlations were observed between ER and PR positivity and ALN invasion. However, in the same group, positive correlations were observed between C-erbB-2 positivity and ALN invasion and p53 mutation and ALN invasion. These correlations were not statistically significant, except for the correlation of p53 with ALN metastasis in G2 and in the total patient population (Table 4).

Discussion

Breast cancer remains an important health problem despite improved diagnosis and treatment. The proportion of elderly people in the general population has increased due to longer life expectancy and lower birth rates. ALN metastasis is one of the most important prognostic factors in patients with breast cancer, and higher mortality rates correspond to increased axillary invasion (4, 5). Geriatric breast cancer differs from non-geriatric breast cancer, and researchers have recently focused on these points (6). We aimed to investigate the relationships between immunohistochemical parameters

Table 3— Immunohistochemical Parameters and Their Relation to Axillary Lymph Node Metastasis.

	Group 1			Group 2			Group 1+2		
	No	N1	p value	No	N1	p value	No	N1	p value
C-erbB-2	9/17	12/24	0.855	35/69	46/76	0.237	44/86	58/100	0.351
ER	14/18	15/23	0.386	49/70	47/75	0.353	63/88	62/98	0.228
PR	13/17	14/25	0.179	45/68	41/72	0.264	58/85	55/97	0.111
P53	5/17	10/24	0.428	9/59	38/75	**<0.001**	14/76	48/99	**<0.001**

Group 1: Geriatric population, Group 2: Non-geriatric population, Group 1+2: All patients.
ER: Estrogen receptor, PR: Progesterone receptor.

Table 4— Correlations Between Axillary Lymph Node Metastasis and Immunohistochemical Parameters By Group.

Immunohistochemical parameter – The number of axillary lymph node metastases	Group 1		Group 2		Group 1+2	
	Corr.	p	Corr.	p	Corr.	p
CerbB-2	- 0.098	0.541	+ 0.112	0.179	+ 0.064	0.383
ER	+ 0.017	0.918	- 0.109	0.191	- 0.077	0.297
PR	- 0.105	0.510	- 0.116	0.172	- 0.110	0.141
P53	+ 0.146	0.361	+ 0.314	<0.001	+ 0.273	<0.001

Group 1: Geriatric population, Group 2: Non geriatric population, Group 1+2: All patients.
ER: Estrogen receptor, PR: Progesterone receptor.

and ALN metastasis and identify differences between patients aged over 65 and patients under age 65.

ER and PR measurements are essential prior to treatment because the presence of these proteins indicates that the patient will benefit from hormone therapy (7). Elderly patients with breast cancer exhibit increased expression of ER and PR, and hormone therapy is advocated as the primary therapy for this population (8-10). Our geriatric patients exhibited 71.4% ER positivity and 65.1% PR positivity, while non-geriatric patients exhibited 66.0% ER positivity and 61.1% PR positivity. A positive correlation was observed between ER and ALN metastasis (p = 0.918) in the geriatric patient group, but a negative correlation was observed between these parameters in the non-geriatric group (p = 0.191). We observed negative correlations between PR and ALN metastasis in both groups (the associated p values were 0.510 and 0.110, respectively). These findings were not statistically significant. Mutlu et al. found no differences in receptor status between 108 geriatric and 183 non-geriatric patients with breast cancer (6).

C-erbB-2 is an oncogene for which increased expression indicates a poor prognosis and a higher probability of recurrence among patients with breast cancer (7, 11, 12). We detected positivity for C-erbB-2 in 52.4% of G1 and 55.6% of G2. Over expression of human epidermal growth factor occurs in approximately 20-25 % of invasive breast cancers (13). A comparison of correlations between C-erbB-2 and ALN metastasis revealed a negative correlation in geriatric patients (p = 0.541) and a positive correlation in non-geriatric patients (p = 0.179); however, these correlations were not statistically significant. Slamon et al. (14) reported that 40% of ALN-positive breast cancer patients exhibited C-erbB-2 expression, with a 2- to 7-year follow up.

P53 is a tumor suppressor gene that is activated to eliminate DNA damage caused by ultraviolet light and other carcinogens. If the damage fails to be repaired, the cell is directed to undergo apoptosis. Close relationship was observed between a damaged chromosome 17, which carries the p53 gene, and histopathological characteristics of breast cancer (15, 16). Excessive production of mutant p53 in tissues is an indicator of poor prognosis in breast cancer patients. We detected positivity for mutant p53 in 35.7% of G1 and 34.6% of G2. Sirvent et al. (16) reported 45.3% positivity for p53 in an immunohistochemical analysis of 192 cases of infiltrating ductal carcinoma of the breast and concluded that a prognostically significant relationship exists between the expression of p53 and shorter survival time and disease-free interval. This is relevant for all patients as well as for those who presented with lymph-node metastases at the time of diagnosis. Our findings demonstrated that a positive correlation existed between high p53 mutations and ALN metastasis in each group; this correlation was statistically significant in the non-geriatric group and in the total patient population (the associated p values were 0.361, <0.001 and <0.001 for G1, G2 and G1+G2, respectively).

In conclusion, immunohistochemical parameters in breast cancer patients may predict prognosis. Higher p53 mutations indicate increased ALN metastasis. Particularly in the non-geriatric patient population, these findings are critical and indicate a poor prognosis.

Conflict of Interest

None

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Abdurrahim TURKOGLU[1]
Mehmet TOKDEMİR[1]
Turgay BORK[2]
Ferhat Turgut TUNCEZ[1]

RESEARCH

FORENSIC AUTOPSIES OF GERIATRIC DEATHS CONDUCTED IN ELAZIG

ABSTRACT

Introduction: The elderly population is rapidly growing throughout the world due to the increased life span of individuals, parallel to advances in the fields of medicine and technology, improvements in socio-economic conditions, and a decreased reproduction rate. The aim of the present study was to get epidemiological data on forensic deaths and autopsy findings in elderly people.

Materials and Method: Of 1439 cases that underwent an autopsy in the Department of Forensic Medicine in Elazıg Firat University Faculty of Medicine in a five-year period between January 2008 and December 2012, 345 cases (23.9%) aged 65 and over were evaluated for age, gender, and place and cause of death.

Results: The mean age of the cases was 73.7±7.6 years; 24 (73.6%) were males and 91 (26.4%) were females. Of these deaths, 207 (60.0%) occurred in the city center. Accidents were the most common cause of death, occurring in 181 cases (52.5%), followed by natural causes occurring in 112 (32.5%) cases. Traffic accidents (54.3%) and falls (21.5%) were found to be the most common causes of unnatural death, and myocardial infarction (72.1%) and cerebrovascular diseases (11.5%) was the most common causes of death from natural causes. 63% (80 cases) of traffic accidents were pedestrian accident.

Conclusion: In order to reduce mortality in the elderly population, more emphasis must be placed on personal health checks, which should be performed with higher frequency. More stringent safety measures should be taken in order to reduce the risk of accidents, and public awareness should be raised regarding the safety of elderly people.

Key Words: Forensic Medicine; Autopsy; Aged; Death.

ARAŞTIRMA

ELAZIĞ'DA ADLİ OTOPSİSİ YAPILAN GERİATRİK ÖLÜMLERİN DEĞERLENDİRİLMESİ

ÖZ

Giriş: Tıp ve teknoloji alanındaki gelişmelere paralel olarak yaşam sürelerinin uzaması, sosyoekonomik koşulların iyileşmesi ve azalan doğurganlık ile birlikte son yıllarda yaşlı nüfus oranı tüm dünya da giderek artmaktadır. Çalışmamızda; yaşlı adli ölümlerine ait epidemiyolojik verilerin ve otopsi bulgularının tartışılması amaçlandı.

Gereç ve Yöntem: Elazığ'da Ocak 2008-Aralık 2012 yılları arasındaki 5 yıllık süreçte Fırat Üniversitesi Adli Tıp Anabilim Dalı'nda otopsisi yapılan 1439 olgudan 65 yaş ve üzerindeki 345 (%23.9) olgu değerlendirildi. Bu olgular yaş, cinsiyet, ölüm yeri, orijin ve ölüm nedeni açısından incelendi.

Bulgular: Olguların yaş ortalaması 73.7±7.6 olup, 24'ü (%73.6) erkek, 91'i (%26.4) kadındır. Ölümlerin 207'sinin (%60.0) il merkezinde gerçekleştiği belirlendi. En sık ölüm 181 olgu (%52.5) ile kaza orijinli olup, bunu 112 olgu (%32.5) ile doğal sebeplerin takip ettiği görüldü. Doğal olmayan ölümlerin en sık trafik kazaları (%54.5) ve düşme %21.5, doğal ölümlerin ise en sık miyokart enfarktüsü (%71.4) ve serebro-vasküler hastalık (%11.5) nedeniyle meydana geldiği belirlendi. Trafik kazalarının %63'ü (80 olgu) yaya kazaları olduğu belirlendi.

Sonuç: Yaşlı ölümlerinin azaltılması için kişiye ait sağlık kontrollerine önem verilmeli ve sıklığı arttırılmalı, yaşlılara yönelik kaza risklerini önleyici güvenlik tedbirleri arttırılmalı ve yaşlıların güvenliği konusunda toplumsal farkındalık sağlanmalıdır.

Anahtar Sözcükler: Adli Tıp; Otopsi; Yaşlı; Ölüm.

İletişim *(Correspondance)*

Turgay BORK
The Council of Forensic Medicine Department of Forensic Medicine OSMANİYE

Tlf: 0536 795 86 88
e-posta: tbork7@hotmail.com

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[1] Fırat University Faculty of Medicine Department of Forensic Medicine ELAZIĞ
[2] The Council of Forensic Medicine Department of Forensic Medicine OSMANİYE

Introduction

Globally, the process of increasing growth in the elderly population is one of the important changes in population demographics (1). The age distribution of the population changes during this process, and the decrease in mortality and fertility is accompanied by increased life expectancy after birth (2). The elderly population in the United States grew by 80% from 1920 to 2000, and it is anticipated that people over 65 years of age will comprise 20% of the American population in 2030 (3). According to data from the World Health Organization, the proportion of elderly was 16.9% in developed countries and 6.3% in developing countries (4). According to data from the Turkish Statistical Institute (TSI), the elderly aged above 65 represented 7.7% of the population in 2011 (5).

The rate of forensic geriatric deaths is increasing, parallel to the increase in the rate of elderly in the general population. Geriatric deaths due to natural causes often occur as sudden unexpected deaths. Trauma is the underlying cause of unnatural deaths, which can be attributed to accidents, homicide, or suicide (6). Although deaths in the elderly often result from natural causes, a considerable number of deaths are associated with accidents, murder, or suicide (7). The forensic autopsy investigation is considered necessary if a solitary person living alone is found dead with no history to suggest a cause of death (8).

In the present study, autopsies conducted in geriatric deaths were evaluated in order to make suggestions for reducing these deaths.

Materials and Method

A total of 345 cases aged over 65 that underwent forensic autopsy at the Department of Forensic Medicine in Elazıg Firat University Faculty of Medicine between January 1, 2008 and December 31, 2012 were included in the study. The forensic autopsy reports and post-mortem examination reports were retrospectively evaluated. The cases were assessed in terms of age, gender, and manner and cause of death. Descriptive statistics were tabulated as mean ± standard deviation, number, and percentage. The data were analyzed using SPSS 17.0 (Statistical Package for Social Science) for Windows. Pearson's chi-square test was used for data analysis, and a p value of less than 0.05 was considered statistically significant. The study was approved by the Firat University Ethics Committee.

Results

Of 1439 cases that underwent forensic autopsy at the Department of Forensic Medicine in Elazıg Firat University Faculty of Medicine in a five-year period, 345 cases (23.9%) were found to be over 65 years of age. Of the cases, 254 (73.6%) were males and 91 (26.4%) were females. The patients were aged between 65 and 99 years, and the mean age was 73.6±7.6 years. The age distribution was as follows: 205 cases (59.4%) from 65-75, 116 (33.6%) from 76-85, and 24 (7.0%) at or above 86. The age and gender distribution of cases are presented in Table 1.

The distribution for manner of death was 181(52.5%) accidents, 112 (32.5%) natural causes, 34 (9.8%) suicides, and 18 (5.2%) homicides. The distribution of cases according to manner of death is shown in Figure 1.

The distribution of manner of death according to age group showed that accidents were more common in the 65-75 and 76-85 age groups, and natural causes were more common in patients aged at or above 86. The distribution of age groups according to manner of death is shown in Figure 2.

In patients who died of natural causes, myocardial infarction was the most common cause of death, occurring in 80 (71.4%) cases, followed by cerebrovascular diseases in 13

Table 1— The Age and Gender Distribution of Cases.

Age Groups	Gender				Total	
	Male		Female			
	n	%	n	%	n	%
65-75	161	63.4	44	48.4	205	59.4
76-85	79	31.1	37	40.6	116	33.6
≥86	14	5.5	10	11.0	24	7.0
Total	254	100.0	91	100.0	345	100.0

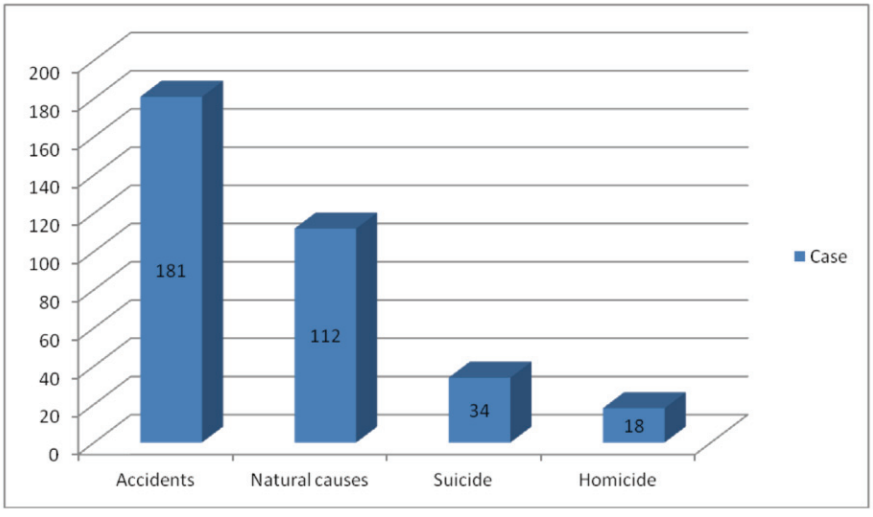


Figure 1— The distribution of cases according to manner of death.

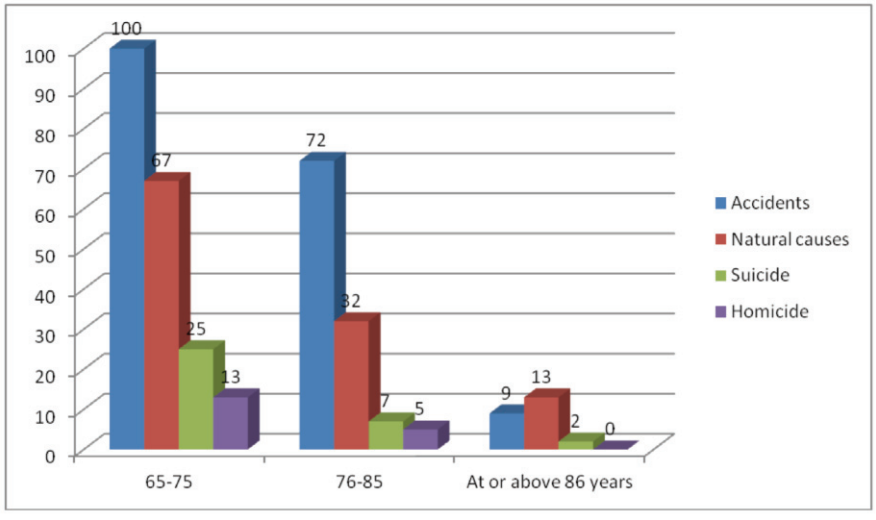


Figure 2— The distribution of age groups according to manner of death.

(11.5%) cases. The underlying causes of death due to natural causes are presented in Table 2.

Accidents were the most common cause of death due to unnatural causes, occurring in 181 cases, and the causes of accidents were traffic accidents (127 cases, 70.2%) and fall from a height (39 cases, 21.5%). Of the motor vehicle accidents, 63% (80) involved motor vehicle-pedestrian accidents and 37% (47) involved vehicle collisions. The distribution of underlying causes of death in accidents is presented in Table 3.

Discussion

The number of forensic geriatric deaths is increasing, parallel to the increase in the number of elderly in the population, and there is an effort to determine the causes of these deaths (9). The rate of elderly people aged over 65 was 12.4% in all forensic autopsies conducted in Ankara (9), 8.1% in Adana (8), and 7.8% in Istanbul (10). In the present study, the rate of elderly people aged over 65 was 24.1% in a five-

Table 2— The Underlying Causes of Death Due to Natural Causes

Causes of Death	Gender				Total	
	Male		Female			
	n	%	n	%	n	%
Myocardial Infarction	58	73.4	22	66.7	80	71.4
Cerebrovascular Disease	9	11.4	4	12.1	13	11.5
Senility - Multiple Organ Insufficiency	4	5.1	2	6.0	6	5.4
Cardiac rupture - Tamponade	4	5.1	1	3.1	5	4.5
Pneumonia	1	1.2	4	12.1	5	4.5
Cancer	2	2.6	-	-	2	1.8
Epilepsy	1	1.2	-	-	1	0.9
Total	79	100.0	33	100.0	112	100.0

Table 3— The Distribution of Underlying Causes of Death in Accidents.

Causes of Deaths	Gender				Total	
	Male		Female			
	n	%	n	%	n	%
Motor Vehicle Accident	98	69.5	29	72.5	127	70.2
Fall from Height	33	23.4	6	15.0	39	21.5
Drowning in Water	5	3.6	-	-	5	2.8
Hypothermia	-	-	4	10.0	4	2.2
CO poisoning	2	1.4	1	2.5	3	1.6
Animal Kick	2	1.4	-	-	2	1.1
Burns	1	0.7	-	-	1	0.6
Total	141	100.0	40	100.0	181	100.0

year period. The rate of elderly in the present study seems to be higher compared to the other studies. The authors consider that this can be explained by high rates of forensic autopsy in cases that involved motor vehicle collisions.

The rate of males was higher than females in many studies that have evaluated forensic cases (9). The rate of males was found to be 71.6% in Istanbul (10), 72.5% in Ankara (9), 57.0% in Japan (11), and 58.0% in the USA (7). Consistent with the literature, the rate of males in the present study was 73.6% (254).

In our study, the distribution of cases according to manner of death showed that the cause was accidents in 181 (52.5%) cases, natural causes in 112 (32.5%) cases, suicide in 34 (9.8%) cases, and homicide in 18 (5.2%) cases. A study from the USA on forensic geriatric deaths reported that natural causes were the most common cause of death, followed by accidents (7). In a study conducted in Ankara (9), death was by natural causes in 54.4% of cases, accidents in 27.5%, suicide in 9.9%, and homicide in 8.2%, whereas in the study conducted in the USA (7), the manner of death was natural causes in 70.5% of cases, accidents in 16.1%, homicide in 6.4%, suicide in 6.0%, and undetermined cause in 1.0%. The forensic autopsies are not usually performed in deaths caused by motor vehicle accidents, and an inhumation license is issued based on post-mortem examination. In another study conducted in the same region in the same period, forensic autopsies were conducted on 92% of cases of motor vehicle accidents. The natural deaths rank first in studies conducted in other countries. The forensic officers in the US and Europe do not issue a death certificate based on insufficient data and without performing effective investigation, and they order an autopsy with the assumption of suspicious death even if they consider that it was a natural death.

The studies conducted to cardiovascular system disorders were the most common cause of natural death. Central nervous system disorders were ranked second among the natural causes (12). The underlying cause of death was cardiovascular disorders in 52.9% and cerebrovascular causes in 4.4% of the cases in Ankara, and cardiovascular causes in 83.9% and cerebrovascular causes in 4.8% of the cases in Adana. In a study conducted in the USA (13), cardiovascular causes accounted for 78% of the geriatric deaths that occurred outside of the hospital. In the present study, cardiovascular causes were responsible for 85 out of 112 deaths that occurred due to natural causes and cerebrovascular causes were responsible for 13 deaths (11.6%). Cardiovascular disorders should be considered in forensic autopsy of elderly deaths.

In the geriatric age group, the rate of death from natural causes increases with age. In a study by John et al. (14), natural causes accounted for 85% of forensic deaths in patients aged above 90 years, and cardiovascular causes were reported to be the most common. In the present study, distribution of cases according to age group showed that death from natural causes was significantly higher among subjects aged over 86. Individual mobility decreases with increasing age, and people die of natural causes rather than accidents.

In the present study, motor vehicle accidents were the most common cause of unnatural deaths. In a study conducted in the USA (15), pedestrian deaths were reported to occur most frequently in people over 75 years of age. It was suggested that people in this age group are at higher risk of sustaining motor vehicle/pedestrian injuries than other age groups due to reduced physical capabilities, sensory impairment, and distractibility. Consistent with the literature, motor vehicle accidents (70.2%) were the most common cause of unnatural deaths, and motor vehicle/pedestrian collisions were the most common cause accident-related deaths, occurring in 63% of the cases. This was followed by falls from a height (21.5%). Driver awareness should be increased with respect to the elderly. Safety measures can be further improved in order to reduce the risk of accidents involving geriatric people.

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Şeyda PEZEK AYDIN
Füsun BOZKIRLI

RESEARCH

A COMPARISON STUDY OF SINGLE DOSE VERSUS CONTINUOUS SUBARACHNOID LEVOBUPIVACAINE FOR TRANSURETHRAL RESECTION

ABSTRACT

Introduction: Single dose and continuous spinal anesthesia with levobupivacaine were compared regarding quality of anesthesia, hemodynamic parameters, and potential complications in geriatric patients scheduled for transurethral resection.

Materials and Method: Sixty geriatric patients scheduled for transurethral resection were divided into two groups as single dose spinal anesthesia (n=30) and continuous spinal anesthesia (n=30). The single dose anesthesia group was administered 12.5 mg isobaric levobupivacaine (0.5%), and the continuous spinal anesthesia group was administered isobaric levobupivacaine (0.5%) at 2.5 mg doses intrathecaly subsequent to a starting dose of 5 mg, until the T10 level of analgesia was achieved.

Results: The amount of levobupivacaine was lower in the continuous spinal anesthesia group ($p<0.0001$). The median maximum level of sensory block was T8 and T9 in the single and continuous spinal anesthesia group respectively. The time to onset of sensory block at T10 and time to achieve maximum sensory block were longer in the continuous spinal anesthesia group ($p<0.0001$). During surgery, there was a decrease in heart rate starting from the 25th min in the single dose group and the 40th min in the continuous spinal anesthesia group ($p<0.05$). The systolic arterial pressure between 15 and 40 minutes was lower in the single dose group ($p<0.05$) than control values. Slower onset of sensory block in the continuous spinal anesthesia group prevented the development of hypotension. Paresthesia during intervention was significantly higher in the continuous spinal anesthesia group ($p<0.05$).

Conclusion: Continuous spinal anesthesia with levobupivacaine is safer than single dose spinal anesthesia in geriatric patients because it provides improved hemodynamic stability due to slower onset of sensory block.

Key Words: Transurethral Resection of Prostate; Anesthesia, Spinal; Levobupivacaine.

ARAŞTIRMA

TRANSÜRETRAL REZEKSİYONDA TEK DOZ VE SÜREKLİ SUBARAKNOİD LEVOBUPİVAKAİN UYGULAMASININ KARŞILAŞTIRILMASI

ÖZ

Giriş: Transüretral rezeksiyon planlanan geriatrik hastalarda anestezi kalitesi, hemodinamik parametreler ve olası komplikasyonlar açısından, intratekal levobupivakain ile tek doz ve sürekli spinal anestezi uygulamaları karşılaştırıldı.

Gereç ve Yöntem: Transuretral rezeksiyon planlanan 60 geriatrik hasta tek doz spinal anestezi (n=30) ve sürekli spinal anestezi (n=30) olarak iki gruba ayrıldı. Tek doz spinal anestezi grubuna 12.5 mg izobarik levobupivakain (%0.5), sürekli spinal anestezi grubuna 5 mg başlangıç dozundan sonra T10 düzeyinde analjeziye ulaşıncaya kadar 2.5 mg dozlarda izobarik levobupivakain (%0.5) intratekal uygulandı.

Bulgular: Levobupivakain miktarı sürekli spinal anestezi grubunda daha düşüktü ($p<0.0001$). Duyusal bloğun medyan maksimum düzeyi tek doz spinal anestezi grubunda T8, sürekli spinal anestezi grubunda T9 idi. T10'da duyusal blok başlama zamanı ve maksimum duyusal bloğa ulaşma zamanı sürekli spinal anestezi grubunda uzundu ($p<0.0001$). Ameliyat sırasında, tek doz spinal anestezi grubunda 25. ve sürekli spinal anestezi grubunda 40. dakikadan başlayarak kalp hızında azalma vardı ($p<0.05$). Tek doz spinal anestezi grubunda 15 ve 40'ıncı dakikalar arasındaki sistolik arter basıncı kontrol değerlerine göre düşüktü ($p<0.05$). Sürekli spinal anestezi grubunda duyu bloğunun yavaş başlaması hipotansiyon gelişmesini önledi. Girişim sırasında parestezi sürekli spinal anestezi grubunda yüksekti ($p<0.05$).

Sonuç: Geriatrik hastalarda levobupivakain ile sürekli spinal anestezi, duyusal bloğun daha yavaş başlaması nedeniyle daha iyi hemodinamik stabilite sağladığından tek doz spinal anestezideden daha güvenlidir.

Anahtar Sözcükler: Transüretral Rezeksiyon; Spinal Anestezi, Levobupivakain.

İletişim *(Correspondance)*

Şeyda PEZEK AYDIN
Gazi Üniversitesi Tıp Fakültesi Anesteziyoloji ve Reanimasyon Anabilim Dalı ANKARA

Tlf: 0312 202 4166
e-posta: seydapezekaydin@gmail.com

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Gazi Üniversitesi Tıp Fakültesi Anesteziyoloji ve Reanimasyon Anabilim Dalı ANKARA

Introduction

Levobupivacaine, the pure S (-) enantiomer of bupivacaine, has been shown to be as potent as bupivacaine; equal doses of levobupivacaine and bupivacaine have been shown to produce a similar sensory and motor block (1-3). Additionally, levobupivacaine has fewer central nervous system and cardiovascular side effects than bupivacaine (3-5). Therefore, it is considered to be a better option for a subarachnoid block in geriatric patients who have comorbid systemic diseases. Transurethral resection (TUR) of the prostate remains the gold standard treatment for surgical management of bladder outlet obstruction. TUR of the bladder is used to view the inside of the bladder, remove tissue samples, and/or remove tumors.

Spinal anesthesia, which has several advantages over general anesthesia, is the method of choice for TUR (6-9). It can be used in patients with significant respiratory disease; it provides good postoperative analgesia and may reduce the stress response to surgery. A spinal block to T10 is required to eliminate the discomfort caused by bladder distension. Single dose spinal anesthesia (SDSA) has some drawbacks, including hypotension and the inability to extend the block when anesthesia is inadequate. Continuous spinal anesthesia (CSA), performed by inserting a catheter into the intrathecal space, allows the use of a lower dose of local anesthetic; with this method, compensation mechanisms can be activated by gradual development of anesthesia. Also, anesthesia can be prolonged by repeated administration of small doses (10).

This study aimed to investigate and compare the quality of anesthesia, hemodynamic parameters, and potential complications between SDSA and CSA with intrathecal levobupivacaine in geriatric patients scheduled for TUR.

Materials and Method

The present prospective randomized comparative study was performed in the Department of Anesthesiology and Reanimation, Gazi Medical University, Ankara Turkey between August 2007 and January 2009. The Ministry of Health of Turkey General Directorate of Pharmaceuticals and Pharmacy Ethics Board approval was obtained. Sixty geriatric patients over the age of 65, who were classified in the American Society of Anesthesiologists (ASA) risk group II-III, scheduled for TUR, were enrolled in the study upon written informed consent. Patients with contraindications for regional anesthesia, preoperative motor or sensory loss, or anemia (hemoglobin<10 g/dL) were excluded. After at least 6 h of fasting, patients were taken to the operating room without any premedication. After intravenous cannulation, the patients received an IV infusion of 8 mL/kg lactated Ringer solution over 15 min. Then, during the surgery, they received 0.9% NaCl infusion at a rate of 4 mL/kg/h. Patients received O_2 at a rate of 4 L/min via a face mask throughout the procedure. Heart rate (HR), systolic arterial pressure (SAP), diastolic arterial pressure (DAP), mean arterial pressure (MAP), and peripheral oxygen saturation (SpO_2) were monitored noninvasively.

The patients were randomly assigned to 2 groups to receive either SDSA (Group SDSA, n=30) or CSA (Group CSA, n=30). Their baseline hemodynamic values were recorded. Spinal anesthesia was performed at the L3-4 or L4-5 interspinous space, in a sitting position. In both groups, 0.5% isobaric levobupivacaine (Chirocaine® 0.5% 10 mL flacon, Abbott, Norway) was used. In the SDSA group, a single dose of (2.5 mL) 0.5% levobupivacaine was injected into the intrathecal space in 30 s using a 25 G *Quincke* spinal needle. In the CSA group, an 18 G modified epidural needle (*Crawford* tip) in the Spinocath® (B. Braun Melsungen AG. Germany) was placed into the epidural space by the loss of resistance method. Then, the Spinocath® with a 22 G catheter over a 27 G spinal needle (*Quincke* tip) was advanced through the epidural needle until dural penetration was felt. The catheter was placed into the intrathecal space until 3 cm of the catheter remained inside. After the procedure was completed, the patients were placed in the supine position. In the CSA group, the catheter was filled with 0.1 mL of isobaric 0.5% levobupivacaine solution and a starting dose of 1 mL (5 mg) levobupivacaine was injected, after catheter placement. If the level of the sensory block did not reach T10 within 15 min, additional doses of 0.5 mL (2.5 mg) isobaric levobupivacaine were administered at 5 min intervals until T10 sensory level was achieved. When a T10 sensory level was achieved, patients in both groups were placed in the lithotomy position, and the surgery was initiated. Patients' HR, SAP, DAP, MAP, and SpO_2 values were recorded at 2.5 min intervals for 10 min following subarachnoid injection, at 5 min intervals for the following 60 min, at the end of the operation, and at 10 min intervals for one hour postoperatively. A decrease in SAP below 90 mmHg or a 20% decrease in MAP compared to baseline during the surgery was considered hypotension, and was treated with IV ephedrine at a dose of 5-10 mg.

The volume of fluid infusion and total volume of washing fluid during surgery were recorded. An HR under 50/min was considered bradycardia and treated with IV atropine at a dose of 0.01 mg/kg.

Level of sensory block was evaluated with the "*pinprick*" test, and motor block was evaluated using a modified Bromage scale (0= no paralysis, can move the thigh, leg, and feet; 1= cannot move the thigh, but can move the knee; 2= cannot move the knee but can move the ankle; 3= cannot move the lower extremities at all). The catheters of the SDSA group were removed 12 h after surgery. The patients were monitored for 48 h for potential complications.

Statistical analysis was conducted using the Statistical Package for the Social Sciences (SPSS, Inc., Chicago, IL, USA) version 12.0, and the data were expressed as mean±standard deviation, median, minimum-maximum, n, and percentages (%). The Kolmogorov-Smirnov test was used to test for normality. Student's t-test was used for normally distributed values and the Mann Whitney U-test was used for non-normally distributed variables. Chi-square or Fisher's exact Chi-square tests were used to compare variables including gender, ASA, paresthesia, perioperative side effects, and ephedrine or atropine use between the groups. A p value <0.05 was considered statistically significant.

RESULTS

The study included 60 patients, 30 patients in each group, and apart from 1 patient in the SDSA group, all patients were male. No statistically significant differences were found between the groups in terms of demographic data and the type of surgery (p<0.05) (Table 1).

Mean operation times, number of spinal puncture attempts, volume of fluid infusion before anesthesia, total fluid infusion and total volume of washing fluid were similar in both groups. The rate of paresthesia development during the procedure was significantly higher in the SDSA group (p<0.05) and the dose of levobupivacaine was significantly lower in the CSA group (p<0.0001) (Table 1). The maximum level of sensory block was T8 in the SDSA group and T9 in the CSA group. The time to reach T10 sensory block and the time to achieve maximum sensory block level were significantly longer in the CSA group (p<0.0001). The time to two-segment regression of sensory block, the time to full sensory recovery, and the time to onset of motor block and the time to full motor recovery were similar in both groups (Table 2).

The median dermatomal spread of sensory block at different time points was significantly different between the groups (p<0.05). Sensory block levels at different time points were higher in the SDSA group. In both groups, a significant increase in sensory block levels was observed at all times, compared with the values at 2.5 min after injection (p<0.05) (Table 3).

The mean motor block levels in the measurements obtained between 20 min and 40 min were significantly higher in the SDSA group than those in the CSA group (p<0.05). Mo-

Table 1— Demographic Characteristics and Parameters Associated with Anesthesia Procedure in the Study Groups.

	Group SDSA (n=30)	Group CSA (n=30)	p
Age (years)	70.1±6.5	69.8±4.3	0.796
Body Weight (kg)	74.0±8.9	72.4±10.1	0.516
Height (cm)	167.9±5.7	168.5±5.6	0.69
ASA (II/III)	20/10	27/3	0.057
Gender (Male/Female)	29/1	30/0	0.500
Surgery (TUR-P/TUR-Tm)	26/4	27/3	0.687
Operation time (min)	70.1±21.6	73.8±23.3	0.526
Number of spinal puncture attempts	1.3±0.6	1.1±0.3	0.171
Volume of fluid infusion before anesthesia (mL)	441.7±132.1	458.3±10	0.597
Total fluid infusion (mL)	1275.0±30	1271.7±3.0	0.969
Total volume of washing fluid (mL)	16266.7±864	16733.3±890	0.813
Paraesthesia during block	1 (3.3)	7 (23.3)[a]	0.023
Amount of local anesthetic (mL)	12.5±0.0	10.0±2.8[a]	<0.0001

Data are presented as mean±standard deviation or n/n or number (%), where appropriate.
[a]p<0.05 (compared with SDSA group). SDSA, single dose spinal anesthesia; CSA, continuous spinal anesthesia; ASA, American Society of Anesthesiologists; TUR-P, transurethral resection of the prostate; TUR-Tm, transurethral resection of tumor.

Table 2— Variables Related to Sensory and Motor Block.

	Group SDSA (n=30)	Group CSA (n=30)	p
Time to achieve T10 sensory level (min)	8.3±5.7	19.1±9.9a	<0.0001
Time to achieve maximum sensory block (min)	15.6±9.4	29.3±12.7[a]	<0.0001
Maximum level of sensory block	T8	T9[a]	0.020
Motor block development (min)	6.9±5.2	10.1±9.0	0.102
Two-segment regression of sensory block (min)	106.2±32.1	115.4±32.9	0.274
Time to full sensory recovery (min)	232.4±47.5	240.7±41.2	0.472
Time to full motor recovery (min)	176.9±47.9	180.6±41.7	0.747

[a]p<0.05 (compared with SDSA group).
Data are presented as mean±standard deviation.
SDSA, single dose spinal anesthesia; CSA, continuous spinal anesthesia.

Table 3— Sensory Block Levels According to Dermatomes.

Time	Group SDSA (n=30)	Group CSA (n=30)	p
2.5 min	L_1 ($-T_6$)	L_2[a] ($-T_{12}$)	0.003
5 min	T_{12}[b] (L_5-T_4)	L_1[a,b] (L_4-T_9)	<0.0001
7.5 min	T_{10}[b] (L_1-T_4)	T_{12}[a,b] (L_4-T_{10})	<0.0001
10 min	T_8[b] ($T_{12}-T_4$)	T_{12}[a,b] (L_4-T_8)	<0.0001
15 min	T_8[b] ($T_{12}-T_4$)	T_{12}[b] (L_4-T_8)	<0.0001
20 min	T_8[b] ($T_{12}-T_4$)	T_{10}[a,b] (L_1-T_8)	<0.0001
25 min	T_8[b] ($T_{10}-T_4$)	T_{10}[a,b] (L_1-T_7)	<0.0001
30 min	T_8[b] ($T_{10}-T_4$)	T_{10}[a,b] (L_1-T_6)	<0.0001
35 min	T_8[b] ($T_{10}-T_4$)	T_{10}[a,b] ($T_{12}-T_6$)	<0.0001
40 min	T_8[b] ($T_{10}-T_4$)	T_{10}[a,b] ($T_{10}-T_6$)	0.006
45 min	T_8[b] ($T_{10}-T_4$)	T9[a,b] ($T_{10}-T_6$)	0.033
60 min	T_8[b] ($T_{12}-T_4$)	T_9[a,b] ($T_{10}-T_6$)	0.035
End of operation	T_8[b] (L_2-T_4)	T_{10}[a,b] (L_1-T_6)	0.009

[a]p<0.05 (compared with SDSA group).
[b]p<0.05 (compared with the values at 2.5 min post-injection).
SDSA, single dose spinal anesthesia; CSA, continuous spinal anesthesia.

tor block levels were significantly higher at all measurement times compared with the values at 2.5 min after the injection in the SDSA group (p<0.05). However, compared to the levels at 2.5 min, motor block levels showed a significant increase starting from 7.5 min in the CSA group (p<0.05) (Table 4).

In the perioperative period, the HR of the SDSA group was lower than that of the control values after the 25th min, and the HR of the CSA group was lower than that of the control values from the 40th min onwards (p<0.05) (Figure 1A). The mean SAP between 15 and 40 minutes was lower in the SDSA group in comparison to that of the control values (p<0.05) (Figure 1B). Although the rates of hypotension and bradycardia were higher in the SDSA group (16.7% and 6.7%, respectively) than in the CSA group (6.7% and 3.3%, respectively), there was no statistically significant difference between the groups (p>0.05). Additionally, there was no nausea, vomiting, and depression of breathing in either group.

Discussion

In the present study, intrathecal administration of levobupivacaine was successful in providing qualified anesthesia in both groups. Compared to the SDSA group, a lower amount

Table 4— Motor Block Degree Values According to The Modified Bromage Scale at Different Time Points.

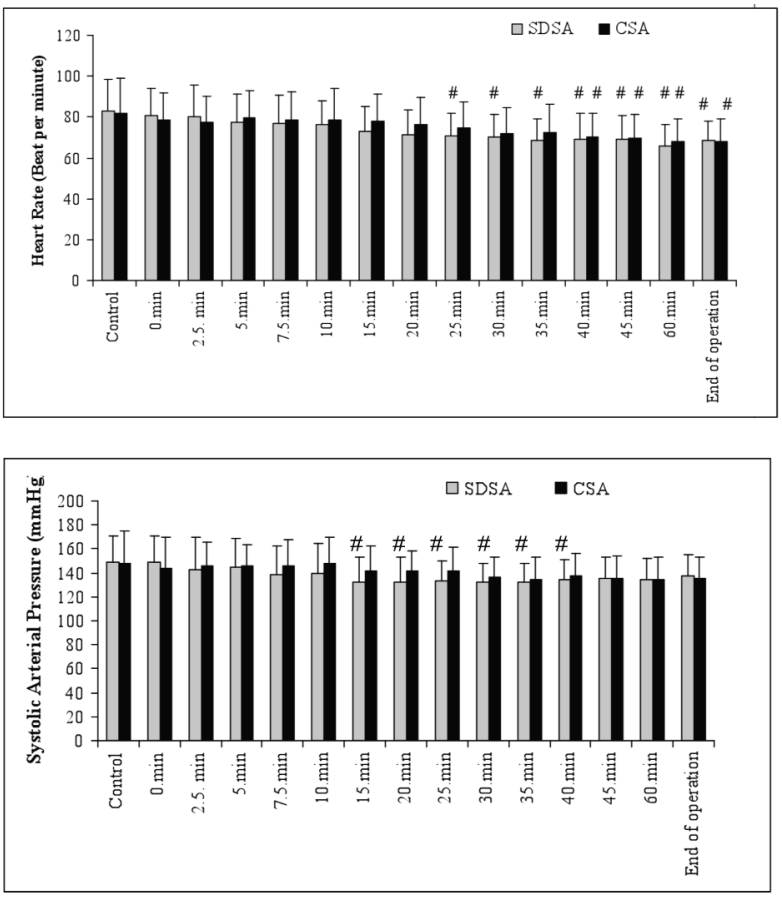
	Group SDSA (n=30)	Group CSA (n=30)	p
2.5 min	0.47±0.73	0.33±0.76	0.294
5 min	1.13±1.10[b]	0.70±0.91	0.125
7.5 min	1.60±1.19[b]	1.27±1.11[b]	0.261
10 min	2.03±1.19[b]	1.50±1.22[b]	0.089
15 min	2.37±0.96[b]	1.83±1.18[b]	0.057
20 min	2.73±0.52[b]	2.17±1.09[a,b]	0.029
25 min	2.90±0.31[b]	2.47±0.89[a,b]	0.036
30 min	2.93±0.25[b]	2.57±0.82[a,b]	0.032
35 min	2.97±0.18[b]	2.60±0.81[a,b]	0.021
40 min	2.97±0.18[b]	2.70±0.59[a,b]	0.023
45 min	2.97±0.18[b]	2.80±0.48[b]	0.085
60 min	2.88±0.44[b]	2.80±0.48[b]	0.365
End of operation	2.83±0.50[b]	2.86±0.46[b]	0.535

[a]p<0.05 (compared with SDSA group).

[b]p<0.05 (compared with the values at 2.5 min post-injection).

Data are presented as mean±standard deviation.

SDSA, single dose spinal anesthesia; CSA, continuous spinal anesthesia.



A

B

Figure 1— (A) Heart rate of the groups according to time; **(B)** Systolic arterial pressure of the groups according to time; #p<0.05 (compared to the control value); SDSA, single dose spinal anesthesia; CSA, continuous spinal anesthesia.

of local anesthetic agent was used in the CSA group. Furthermore, the gradual development of sensory block led to improved hemodynamic stability in the CSA group.

Spinal anesthesia using low doses of local anesthetics is a safe method of anesthesia in TUR (11). One of the potential complications of spinal anesthesia is hypotension due to sympathetic blockade. The reasons for severe and prolonged hypotension associated with spinal anesthesia are rapid onset of sympathetic blockade and failure of neurogenic and cardiovascular adaptation mechanisms, particularly in elderly patients (12,13). Rapid intravenous infusion of high amounts of fluid and vasopressors to prevent hypotension may pose risks in patients with cardiac dysfunction (11). CSA, using titrated doses of local anesthetics, is superior particularly in the elderly, in whom the hemodynamic effects of spinal anesthesia are difficult to tolerate (12). While some studies reported bradycardia and hypotension with intrathecal levobupivacaine (14-16), others did not (17).

In this study, HR of the patients was similar in both groups. However, in intra-group comparisons, a significant decrease in HR was observed, starting from the 25th min in the SDSA group, and from the 40th min in the CSA group. The decrease in HR was slower in the CSA group, which might have been due to gradual development of sympathetic block in this group. During the surgery, hypotension occurred in 5 patients (16.7%) in the SDSA group and 2 patients (6.7%) in the CSA group. The incidence of hypotension was similar between the two groups, probably because of the small sample size of the present study.

For TUR of prostate and bladder under spinal anesthesia, a sensory block at or above the T10 dermatome is required (18,19). In the present study, to achieve sensory block to the T10, 12.5 mg of 0.5% levobupivacaine was used in the SDSA group. This dose is similar to the doses used in the previous studies in TUR procedures (14-16,20). In our study, the mean dose of levobupivacaine used was 12.5 mg in the SDSA group and 10±2.79 mg in the CSA group; the use of titrated doses of levobupivacaine allowed for a reduced dose of levobupivacaine in the CSA group. In the SDSA group, the surgery was started after T10 sensory block was achieved and tested with the "*pinprick*" test, and none of the patients experienced pain during surgery. In the CSA group, 8 out of 30 patients suffered from pain after surgery was started and additional levobupivacaine administration was required. In this study, the mean time to achieve sensory block at the T10 level in the SDSA group (8.27±5.70 min) was consistent with the results of previous studies (14,16,20) and the maximum level of sensory block was T8 (T10-T4) in the SDSA group and T9 (T10-T6) in the CSA group. The time to achieve maximum sensory block level is as important as the level of maximum sensory block. In the present study, the time to reach maximum sensory block in the CSA group was 29.33±12.71 min, which was longer than that of the SDSA group (15.60±9.36 min). It is important to use titrated doses of levobupivacaine to extend the compensation time. Although a motor block is not needed for TUR, it is desirable that the patient remain motionless.

In our study, the modified Bromage Scale score of all patients in the SDSA group was 3, while the modified Bromage Scale score of one patient who received 7.5 mg levobupivacaine did not exceed 1 and that of one patient who received 10 mg levobupivacaine did not exceed 2 throughout the surgery in the CSA group. However, this did not lead to any problems. The contact of the spinal needle with spinal roots at its penetrating point to the subarachnoid area leads to temporary paresthesia. In earlier studies, paresthesia was reported by SDSA (21,22) and Spinocath use (4,23). In this study, one patient (3.3%) in the SDSA group and 7 patients (23.3%) in the CSA group developed paresthesia while the catheter was advanced. Paresthesia resolved upon slight withdrawal of the catheter in the CSA group and changing the direction of the needle in the SDSA group. In the postoperative period, none of these patients had nerve irritation or permanent neurological disorders.

Conclusively, the intrathecal administration of levobupivacaine was successful in providing quality anesthesia in groups receiving both SDSA and CSA. Although continuous spinal anesthesia is difficult to perform, more time consuming and expensive technique when compared to single dose spinal anesthesia, in the present study a lower amount of local anesthetic agent was used and the gradual development of maximum sensory block level led to improved hemodynamic stability in the CSA group. Thus, it can be concluded that levobupivacaine by continuous spinal anesthesia is a safer method than single dose spinal anesthesia in elderly patients.

Conflict of Interest: Authors have no conflict of interest.

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Elif DOĞAN BAKI[1]
Özal ÖZCAN[2]
Mehmet Ersegün DEMİRBOĞAN[1]
Serdar KOKULU[1]
Hanife UZEL[3]
Yüksel ELA[1]
Remziye Gül SIVACI[1]

İletişim *(Correspondance)*

Elif DOĞAN BAKI
Afyon Kocatepe University, Anesthesiology and Reanimation AFYON

Tlf: 0272 229 45 09
e-posta: elifbaki1973@mynet.com

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[1] Afyon Kocatepe University, Anesthesiology and Reanimation AFYON
[2] Afyon Kocatepe University, Orthopedics and Traumatology AFYON
[3] Afyon Kocatepe University, Public Health AFYON

RESEARCH

INVESTIGATION OF THE EFFECTS OF ANESTHESIA TECHNIQUES ON INTENSIVE CARE ADMISSION AND POSTOPERATIVE MORTALITY IN ELDERLY PATIENTS UNDERGOING BILATERAL KNEE REPLACEMENT SURGERY

ABSTRACT

Introduction: The purpose of this study is to investigate the effects of anesthesia techniques on intensive care admission, postoperative complications and mortality in elderly patients undergoing elective bilateral knee replacement surgery.

Materials and Methods: A retrospective file review in the Anesthesiology and Reanimation Department of Afyon Kocatepe University between January 2008 and October 2013 was done on patients operated for bilateral knee replacement in the same sessions by the same surgeon

Results: 108 females and 27 males, a total of 135 patients, were included in this study. 83 patients were operated under general anesthesia while 52 were under regional (epidural+spinal) anesthesia. 123 (91.1%) of patients were admitted to service after operation while 12 (8.9%) of them were admitted to the ICU, 10 (7.4%) of whom were in Group G (general anesthesia) and 2 (1.5%) in Group R (regional anesthesia) (p>0.05). The development rates of complications were significantly higher in Group G (11.1%) than in Group R (0.7%) (p=0.005). Hypertension was the most frequent concomitant disease and acute renal failure was the most frequently observed complication. 15 of 16 patients in whom complications were observed had hypertension. Mortality was 1.48% .

Conclusion: Postoperative complications and intensive care unit admission are more frequently encountered among patients operated for bilateral knee replacement under general anesthesia than with regional anesthesia.

Key Words: Aged; anesthesia; Arthroplasty, Replacement, Knee

ARAŞTIRMA

BİLATERAL DİZ PROTEZİ NEDENİYLE OPERE OLAN YAŞLI HASTALARDA ANESTEZİ TEKNİKLERİNİN YOĞUN BAKIMA GİRİŞ VE POSTOPERATİF MORTALİTEYE ETKİSİNİN RETROSPEKTİF OLARAK İNCELENMESİ

ÖZ

Giriş: Bu çalışmanın amacı, elektif bilateral diz protezi uygulanacak yaşlı hastalarda uygulanan anestezi tekniklerinin postoperatif yoğun bakıma giriş, komplikasyonlar ve mortaliteye etkisinin incelenmesidir.

Gereç ve Yöntem: Afyon Kocatepe Üniversitesi Anesteziyoloji ve Reanimasyon Anabilim Dalı'nda Ocak 2008-Ekim 2013 yılları arasında aynı cerrah tarafından aynı seansta bilateral diz protezi yapılan hastalarda retrospektif dosya incelemesi yapıldı.

Bulgular: Çalışmaya 108 kadın, 27 erkek toplam 135 hasta dahil edildi. 83 hastaya genel anestezi uygulanırken, 52 hastaya rejyonel (epidural+spinal) anestezi uygulanmıştır. Operasyon sonrasında hastaların 123'ü (%91,1) servise çıkarken 12'si (%8,9) yoğun bakıma çıkmıştır (hastaların 10'u (%7.4) Grup G'de iken, 2'si (%1,5) Grup R'de idi) (p>0.05). Komplikasyon gelişme oranı Grup G'de (%11,1) Grup R'ye (%0,7) göre anlamlı derecede yüksekti (p=0,005). Hipertansiyon en sık görülen ek hastalık, akut böbrek yetmezliği en sık gözlenen komplikasyondu. Komplikasyon gelişen 16 hastanın 15'inde hipertansiyon mevcuttu. Mortalite %1,48 idi.

Sonuç: Bilateral diz nedeniyle opere olacak hastalarda genel anestezi uygulaması rejyonel anestezi ile karşılaştırıldığında yoğun bakıma çıkış ve postoperatif komplikasyonlar daha fazla olmaktadır.

Anahtar Sözcükler: Yaşlı; Anestezi; Bilateral Diz Protezi.

Introduction

Total knee arthroplasty (TKA), also known as total knee replacement, is one of the most commonly performed orthopedic procedures (1). In recent years this procedure has increased among the elderly day by day. Since most patients presenting as candidates for total knee replacement are older, special attention should be given to the patient's concomitant diseases and review of symptoms. It has been reported that surgical mortality increases 3-fold, while mortality related to anesthesia increases by 20% at this age (2,3).

Neuroaxial and other regional anesthetic techniques play a significant role in reducing the incidence of perioperative thromboembolic complications, providing postoperative analgesia, and simplifying early rehabilitation and hospital discharge in elderly patients undergoing orthopedic procedures (4).

The primary indication for total knee arthroplasty is the pain relief associated with arthritis of the knee in patients who have failed nonoperative treatments. For the properly selected patient, the procedure results in considerable pain relief, as well as improved function and quality of life (5). Despite the potential benefits of total knee arthroplasty, it is an elective procedure and should only be considered after extensive discussion of the risks, benefits, and alternatives.

The purpose of this study was to observe the effects of anesthetic techniques on postoperative mortality and intensive care unit (ICU) requirements in geriatric patients operated for total knee arthroplasty, retrospectively.

Materials and Methods

After the study protocol was approved by the local ethics committee of Afyon Kocatepe University (2014-98), the hospital records and files of 323 patients who had been operated for bilateral knee arthroplasty by the same surgeon between January 2008 and October 2013 were examined retrospectively. Among these patients, those over the age of 65 years and who underwent simultaneous bilateral TKA were enrolled. Finally the study was continued with 136 patients. Patients were contacted by telephone for long-term results.

Demographic data such as age, gender, height, weight, American Society of Anesthesiologists (ASA) physical status and preoperative comorbidities (diabetes, hypertension, coronary artery disease and other neurological conditions) were recorded. Anesthesia method, preoperative and postoperative blood count and biochemical values, intraoperative and postoperative transfusion requirements, intensive care output (and if so, length of ICU stay), and length of hospital stay were also recorded. Postoperative complications (pulmonary, cardiac, renal, neuronal), 1st month, and 6th month mortality were investigated as well. All of the data were evaluated by comparing the patients according to the method of anesthesia that they were administered (Group G=patients that were given general anesthesia, Group R=patients that were given epidural+spinal anesthesia).

IBM SPSS Statistics version 20 was used for all statistical analysis. Data was expressed as mean±SD. The Mann-Whitney U test was used to compare continuous variables and the Chi Square test was used to compare categorical variables. The Wilcoxon signed rank test was used to compare preoperative and postoperative variables. A p value less than 0.05 was considered to indicate a statistically significant difference.

Results

108 females and 27 males, a total of 135 patients, were included in this study. 83 patients were operated under general anesthesia while 52 were under regional (epidural+spinal) anesthesia. There were no significant differences in terms of demographic characteristics (age, weight, height and ASA) of patients between the groups (p>0.05) (Table 1).

Table 1— Patients' Data According to Type of Anesthesia Administered (mean ± SD).

	Group G (n=83) Mean± SD	Group R (n=52) Mean± SD	p
Age (year)	69.51±4.03	68.35±4.01	0.099*
Gender (female/male, n)	67/16	41/11	0.070#
Weight (kg)	71.42±7.97	71.65±5.79	0.575*
Height (cm)	161.24±13.49	162.96±6.61	0.599*
ASA class I/II/III,n	21/41/21	13/27/12	0.742#

*Mann-Whitney, #Chi-Square ASA American Society of Anesthesiologists.

Table 2— Comorbidities of The Patients.

	Group G (n=83)	Group R (n=52)
No comorbidities, n (%)	21 (15.6)	13 (9.6)
DM, n (%)	8 (5.9)	9 (6.7)
HT, n (%)	25 (18.5)	14 (10.3)
COPD, n (%)	2 (1.5)	1 (0.7)
Others, n (%)	3 (2.2)	– (–)
DM+ asthma, n (%)	1 (0.7)	1 (0.7)
DM+HT, n (%)	10 (7.4)	6 (4.4)
CD+asthma, n (%)	1 (0.7)	– (–)
CD+HT, n (%)	5 (3.7)	3 (2.2)
Asthma+HT, n (%)	2 (1.5)	3 (2.2)
DM+CD+Asthma, n (%)	– (–)	1 (0.7)
DM+CD+HT, n (%)	2 (1.5)	– (–)
DM+asthma+HT, n (%)	2 (1.5)	– (–)
CD+asthma+HT, n (%)	1 (0.7)	– (–)
CD+Asthma+HT+DM, n (%)	– (–)	1 (0.7)

#Chi-Square, DM; Diabetes Mellitus, HT;hypertension, COPD; chronic obstructive pulmonary disease, CD; cardiac disease, Others; hypotyroidism, chronic renal deficiency, obesity, P<0.05; statistically significant.

When the comorbidities of the patients were examined, there were no significant differences between the general and regional anesthesia patients (p=0.762). Hypertension was the most common comorbidity that was seen in both groups (Table 2).

Most of the patients (123, 91.1%) were admitted to service after operation while 12 (8.9%) of them were admitted to the ICU= 10 patients from Group G and 2 from Group R (this difference was not statistically significant). In addition, duration of ICU stay and hospital stay were similar for the two groups. The number of patients who were administered perioperative blood transfusion was also similar for the two groups. Mortality was quite low (1.48%) in the study group patients; only 2 patients from Group G died (Table 3). In one of the patients who died, a massive pulmonary embolism developed intraoperatively and she died on the first day postoperatively in the ICU; she had DM + asthma + hypertension and received general anesthesia. The other patient who died was 70 years old and had hypertension only; she developed acute renal failure and died on the fifth day postoperatively; she had also received general anesthesia.

Post-operative complications are shown in Table 4. Complications were observed in a total of 16 (11.9) patients; 15 (11.1%) in Group G and 1 (0.7) in Group R. This difference was statistically significant (p=0.005) (Table 4). The most common complication was acute renal failure (3.7%) (Table 4). All of the patients who developed acute renal failure were from Group G (Table 4).

Perioperative laboratory parameters of patients are shown in Table 5. All parameters were similar in the two groups. Postoperative neutrophil lymphocyte ratio (NLR) and WBC values were significantly higher than preoperative measures in both groups (p<0.001), but there was no significance between the groups (p>0.05). Preoperative and postoperative platelet lymphocyte ratio (PLR) and mean platelet volume (MPV) values were also similar between the groups (Table 5).

Table 3— Postoperative Exit, Perioperative Blood Transfusion and Mortality Dispersion of Patients According to the Type of Anesthesia Given.

	Group G (n=83)	Group R (n=52)	p
Postoperative exit			
Service room, n (%)	73 (88.0)	50 (96.2)	0.128
ICU, n (%)	10 (12)	2 (3.8)	
ICU stay (day)	1	1	
Hospital stay (day)	8.22 ± 3.54	8.35 ± 2.97	0.360*
Perioperative blood transfusion			
Intraoperative, n (%)	54 (65.1)	42 (80.8)	0.067#
Postoperative, n (%)	78 (94)	47 (90.4)	0.401#
Mortality			
1st month, n (%)	2 (1.48)ε	0	0.259#
6th month, n (%)	0	0	

Fisher's Exact test, *Mann Whitney U, #Chi-Square, ICU; intensive care unit, %; within the group, εwithin total of patients.

Table 4— Postoperative Complications and Concomitant Diseases of Patients who Developed Postoperative Complications.

	Group G (83)	Group R (52)	p
Complication, no, n (%)	68 (50.4-81.9)	51 (37.8-98.1)	0.005#
Complication, yes, n (%)	15 (11.1-18.1)	1 (0.7-1.9)	
Pulmonary embolism, n (%)	2 (1.5-2.4)	–	
Acute infact, n (%)	–	1 (0.7-1.9)	
Pneumothorax, n (%)	1 (0.7-1.2)	–	
Acute renal failure, n (%)	5 (3.7-6.0)	–	
Wound infection, n (%)	4 (3.0-4.8)	–	
Delirium, n (%)	1 (0.7-1.2)	–	
Vertigo, n (%)	1 (0.7-1.2)	–	
Anisocoria, n (%)	1 (0.7-1.2)	–	

#p<0.05, Chi-Square, %; of total -within the anesthesia group.

Table 5— Perioperative Hemogram and Biochemical Values of Patients.

	General (n=83) Mean ± SD	Regional (n=52) Mean ± SD	P*
Hemogram			
Hb , preop	13.53±1.45	13.48±1.24	0.858
Hb, postop	10.81±1.43	10.45±1.29	0.190
WBC, preop	7.71±2.9#	7.48±2.18#	0.450
WBC, postop	13.91±3.44#	12.25±3.93#	0.070
MPV, preop	9.68±1.64	9.69±1.24	0.823
MPV, postop	10.36±1.97	10.02±1.26	0.251
NLR, preop	2.36±1.1#	2.55±1.33#	0.480
NRL, Postop	12.96±9.49#	12.03±7.57#	0.897
PLR, preop	129±48.74	133±50.8	0.573
PLR, postop	210± 58,27	211±48.02	0.245
Biochemical			
Na, preop	144.42±13.53	140±2.85	0.861
Na, postop	138.16±3.21	137.31±3.32	0.180
K, preop	4.53±0.38	4.45±0.38	0.325
K, postop	4.14±0.51	4.04±0.339	0.403
BUN, preop	21.55±4.91	17.13±4.02	0.354
BUN, postop	22.22±8.20	20.04±5.19	0.348
Cr, preop	0.78±0.32	2.5±13.20	0.846
Cr, postop	1.01±0.54	0.84±0.20	0.269
Alb, preop	3.39±0.27	3.39±0.35	0.751
Alb, postop	3.21±0.29	3.17±0.34	0.343

*Mann Whitney U, #Wilcoxon,p<0.001 Values are presented as mean ± SD Hb; hemoglobin, WBC; white blood cell, MPV; mean platelet volume, NLR; neutrophil lymphocyte ratio, PLR; platelet lymhocyte ratio, Na; sodium, K; potassium, BUN; blood urea nitrogen, Cr; creatinine, Alb; albumin

Discussion

Since the beginning of the last century, one of the most important social changes is the increase in life expectancy. Today, 12% of the world's population is aged 65 and over. For various reasons, half of this population needs surgical intervention; because of this, they also need anesthesia (3). Geriatric patients who undergo orthopedic procedures often have hip and knee surgery. To the best of our knowledge, there are no studies in the literature comparing, retrospective-

ly, the effectiveness of anesthetic techniques on postoperative mortality and morbidity in geriatric patients operated for bilateral knee arthroplasty. The main findings in the current study were: 1) 123 (91.1%) of patients were admitted to service after operation, while 12 (8.9%) of them were admitted to the ICU: 7.4 % of those were in the general anesthesia group and 2 (1.5%) were in the regional anesthesia group (p>0.05); 2) The rate of complications was significantly higher in Group G (11.1%) than in Group R (0.7%) (p=0.005). Hypertension was the most frequent concomitant disease and acute renal failure was the most frequently observed complication. 15 of 16 patients in whom complications were observed had hypertension; 3) Mortality was 1.48% .

Intensive care requirements are likely to increase in the future because of the increase in the elderly population with serious comorbidities. Besides surgical procedures, anesthesia methods may affect intensive care admission. Kaufmann and colleagues reported that intraoperative neuraxial anesthesia might reduce postoperative admissions to the ICU for high risk patients undergoing elective hip and knee replacement surgery (6). Prospective data have demonstrated that intraoperative hemodynamic stability could be better provided, and less fluid and blood transfusion was necessary, with neuroaxial anesthesia (7,8). In the present study, 12 (8.9 %) patients were admitted to ICU: 7.4 % were in the general anesthesia group and 1.5 % were in the regional anesthesia group. Additionally, the intraoperative transfusion requirement was higher in the regional anesthesia group, but this difference was not statistically significant.

While older age itself is an increased risk, accompanying diseases add to the risk and further reduce organ function. Hypertension is a common problem, especially in elderly patients; it is usually a cause of sudden death with ischemic heart disease (3). These patients cannot tolerate blood and fluid loss well, and arterial-venous blood pressure and fluid-electrolyte balance may deteriorate very easily (9,10). In this study, complications were seen at a significantly higher rate in Group G (11.1%) than in Group R (0.7). Hypertension was the most common comorbid disease. 15 of 16 patients in whom complications were observed had hypertension. This may confirm that we need to be more careful perioperatively in elderly patients with hypertension, and if patients do not have contraindications, regional anesthesia may be the best choice.

Modern total knee arthroplasty consists of resection of the diseased articular surfaces of the knee, followed by resurfacing with metal and polyethylene prosthetic components. Bilateral simultaneous knee arthroplasty has been associated with an increased risk of complications, and patients should be counseled as such. In many studies, it was found that applying bilateral TKA in the same session was superior to one-sided and/or two sessions. Applying bilateral TKA in the same session reduced not only health expenditure but also length of hospital stay, while it was emphasized that rate of complication was not changed (11-13). Sarban et al. compared unilateral and simultaneous bilateral knee arthroplasty performed in patients with gonarthrosis in terms of morbidity and clinical results. They found similar levels of morbidity (14). A 2007 meta-analysis demonstrated that simultaneous bilateral knee replacement carries an increased risk of serious cardiac and pulmonary complications, as well as increased mortality, compared with staged bilateral or unilateral surgery (15). In our study, only patients who underwent bilateral knee surgery in the same session were included, and the mortality rate was low. Length of hospital stay did not differ between the groups.

This study has some limitations. The most important one is its retrospective design, with the deficiency of variability in data collection.

PLR has been recently suggested to be a marker of thrombotic and inflammatory condition, mainly in patients with malignancies (16,17). NLR is a readily available and inexpensive laboratory marker that is used to assess systemic inflammation. In the literature, it has been shown that diabetes mellitus, thyroid functional abnormalities, essential hypertension, valvular heart diseases, acute coronary syndromes, renal and/or hepatic failure, metabolic syndrome, and many inflammatory diseases may potentially affect NLR (18,19). In the present study, postoperative NLR ratio values were significantly higher than preoperative ones in both groups (p<0.001), but there was no significant difference between the groups (p>0.05) (20).

In conclusion, we found that use of regional anesthesia in a selected group of orthopedic patients was not only associated with a lower rate of ICU admission postoperatively, but also led to fewer complications. In addition, it is important to be more careful perioperatively with elderly patients with hypertension. Finally, simultaneous bilateral TKA seems to be a good choice in selected patients. Nonetheless, a prospective study may be required to compare the effects of regional and general anesthesia on morbidity and mortality in elderly patients.

Conflict of interest: None declared

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Tuba DEMİREL
Belgin AKIN

RESEARCH

PREVALENCE AND RISK FACTORS OF URINARY INCONTINENCE AND ITS IMPACT ON QUALITY OF LIFE AMONG 65 YEARS AND OVER WOMEN WHO LIVED IN RURAL AREA

ABSTRACT

Introduction: Despite the physical, psychosocial and economic impact of urinary incontinence, presentation at a healthcare institution is often delayed. This problem negatively affects the daily life of older people and decreases the quality of life.

Materials and Method: This cross-sectional study was conducted to determine the prevalence of urinary incontinence in women aged 65 or over living at home in rural area, the risk factors, and the relation of urinary incontinence to quality of life. The study sample consisted of 268 with systematic samling method selected females in Konya/Aksehir. A questionnaire developed to evaluate the socio-demographic, fertility, urinary incontinence characteristics of the respondents named "Incontinence Quality of Life Instrument" was used to evaluate the effect of urinary incontinence on the quality of life. Kruskal-Wallis Variance, The Chisquare, Yates and Mann-Whitney U tests were used to analyze the data.

Results: Urinary incontinence was observed to be more common among women at an advanced age, who were economically poor and bladder prolapse. The incontinence Quality of Life Instrument scores were negatively affected with perception of their economic status as poor, having delivered their last child at the age 40 or over, having had a twin pregnancy, having had bladder prolapse, mixed type urinary incontinence, urinary incontinence once a day, or urinary incontinence in great amounts, having to change underwear four or more times a day and urinating five or more times at night, and consulting a doctor for their urinary incontinence ($p<0.05$).

Conclusion: Urinary incontinence is common in the elderly and has a negative effect on the quality of life.

Key Words: Geriatrics; Urinary Incontinence; Quality of Life; Nursing.

ARAŞTIRMA

KIRSAL ALANDA YAŞAYAN 65 YAŞ VE ÜZERİ KADINLARDA ÜRİNER İNKONTİNANS GÖRÜLME SIKLIĞI, RİSK FAKTÖRLERİ VE YAŞAM KALİTESİ ÜZERİNE ETKİSİ

ÖZ

Giriş: Fiziksel, psikososyal ve ekonomik etkileri bulunan Üriner İnkontinans (Üİ) genellikle sağlık kurumuna başvuruda gecikilen bir durumdur. Bu sorun yaşlıların günlük yaşamını olumsuz yönde etkilemekte ve yaşam kalitesini düşürmektedir.

Gereç ve Yöntem: Kırsal alanda evde yaşayan 65 yaş ve üzeri kadınlarda üriner inkontinansı görülme sıklığı, risk faktörleri ve üriner inkontinansın yaşam kalitesi ile ilişkisini belirlemek amacıyla yapılan çalışma kesitsel türdedir. Konya/Akşehir'de 65 yaş ve üzeri sistematik örnekleme yöntemiyle seçilmiş 268 yaşlı kadın örneklemi oluşturmuştur. Bireylerin sosyo-demografik, doğurganlık, sağlık durumu ve üriner inkontinansı özelliklerini değerlendirmeye yönelik araştırmacı tarafından geliştirilmiş bir anket formu ve üriner inkontinansın yaşam kalitesine etkisini değerlendirmek için "İnkontinans Yaşam Kalitesi Ölçeği" kullanılmıştır. Verilerin değerlendirilmesinde Kruskal-Wallis Varyans analizi, Mann-Whitney U, Ki-kare ve Yates testi kullanılmıştır.

Bulgular: İleri yaşta, ekonomik durumu kötü ve mesane prolapsusu olan yaşlılarda üriner inkontinansı daha fazla görülmektedir ($p<0.05$). Ekonomik durumunu kötü algılama, son doğumunu 40 yaş ve üzerinde yapma, çoğul gebelik geçirme, mesane prolapsusu geçirme, miks tip üriner inkontinansı görülme, günde bir kez üriner inkontinansı görülme, büyük miktarda üriner inkontinansı görülme, günde dört ve daha fazla kez iç çamaşırı değiştirme, gece beş ve daha fazla kez miksiyona çıkma ve üriner inkontinansı nedeniyle doktora başvurma ile yaşam kalitesi ölçeği değerleri negatif olarak etkilenmiştir ($p<0.05$).

Sonuç: Üriner inkontinansı yaşlılarda yaygın bir durumdur ve yaşam kalitesini olumsuz yönde etkilemektedir.

Anahtar Sözcükler: Geriatri; Üriner İnkontinans; Yaşam Kalitesi; Hemşirelik.

İletişim *(Correspondance)*

Tuba DEMİREL
Selçuk Üniversitesi Hemşirelik Fakültesi KONYA

Tlf: 0332 241 35 41
e-posta: tuba_demirel_70@hotmail.com

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Selçuk Üniversitesi Hemşirelik Fakültesi KONYA

Introduction

Urinary incontinence (UI) has a negative effect on the quality of life and a high economic cost, and is commonly seen in people aged 65 and over (1, 2). Aggozzotti et al. (1) found a UI prevalence of 54.5%, increasing with advancing years [73.7% in women aged 95 years or over]. The UI prevalence in Turkey is 44.2% in the general population, but higher in females, at a rate of 57.1% compared to 21.5% in males (3).

Urinary incontinence patients are reported to frequently suffer from isolation, depression and anxiety due to their incontinence (4). Urinary incontinence is associated with negative psychosocial impacts such as continuous fear of smelling bad, feeling inadequate and dirty, low self-esteem, body image distortion, stigma, shame, sadness, anger, tension, anxiety, depression, loss of sexual desire and avoidance of sexual activity, together with disturbed quality of life (5). Although UI negatively affects quality of life, most women see UI as a normal and natural result of getting old, a taboo and a social issue more than a medical issue, so that they are hesitant to talk about it and often wait to seek medical attention for at least a year after the problem starts (6). It is difficult to determine the real percentage of elderly people with UI, as many elderly individuals see it as a natural result of advanced age and do not seek help (7).

The increased life expectancy has increased the rate of UI in the population and made it an important healthcare issue. Preventing the development of UI to improve the health of the elderly is an important responsibility of healthcare staff. More studies on the frequency and risk factors of incontinence and its effect on the quality of life should be performed and their results disseminated to the society in order to prevent the disorder (4). There are a lot of studies of UI in Turkey but our study has some differences, such as a focus on elderly women and those living in a rural area.

In this study we aimed to determine prevalence and risk factors of UI and its impact on quality of life among women aged 65 years or over who live at home in a rural area, to determine the relevant risk factors and the effect of UI on their quality of life.

Materials and Method

This cross-sectional study was performed to ascertain UI frequency in women aged 65 years or over who live at home in a rural area, to determine the relevant risk factors and the effect of UI on their quality of life.

The study was performed at Aksehir County Family Health Center (FHC) in Konya Province between January-April 2011. The study population consisted of 1369 females aged 65 years or over registered at this Center. Five family physicians were working in the FHC. Average 4000 population registered each family physician, so that it is would be required to be totally 20,000 populations in FHC. However, the FHC had a total of 15,813. The table presented in "prediction of the rate in a population with a specific accuracy" (8) was used to determine the sample size of the study. The rate reported by Bilgili et al. (9) of UI in elderly women (43.6%) was used as input regarding the rate of the studied disorder in the population. Additionally, values of 90% confidence and 5.0% relative accuracy were taken into account to give a sample size of 268 (45.0%) in the table. Values reported in the table closest to this ratio was determined as 45.0%. 45% of the value shown in the table is 268. The systematic sampling method was used to select the sample. We used a randomly address list, which were generated by family physicians according to their computer records, to get systematic sampling method. One chart out of every 5 (N/n: 1369/268= 5) was randomly selected and 268+20 elderly females were determined. We selected 20 extra elderly women in case our participants did not agree to participate in the survey as same as the sample selection method. 12 elderly did not agree to join the study for confidentiality so we substituted data from the extra elderly women. Sample selection criteria and the limitations of the study were living at home, not being bedridden, not having a mental disability [scoring at least 25 points on The Standardized Mini Mental Test (SMMT) or The Standardized Mini Mental State Examination for illiterate (SMMT-E)] and not having undergone urogenital region surgery. This study can be generalized to our elderly population.

Dependent and Independent Variables: The dependent variables of the study were UI status and The Urinary Incontinence Quality of Life Scale (I-QOL) scores**.** The independent variables of the study were socio-demographic, fertility and UI features. Socio-demographic features included age, marital status, educational status and perceived economic status (How do you perceive your economic status?). Fertility features included age at last birth, birth number, twin pregnancies, episiotomy, uterine prolapse and bladder prolapse (Do you feel a prolapse of the uterus or bladder when you stand?). UI features included incontinence type, frequency, amount, under wear change number, night micturition frequency, having a Urinary Tract Infection (UTI), knowing and doing kegel exerci-

se. UI was defined as any involuntary leakage of urine occurring for the past year, at least several times a month. We asked some questions of the participants such as: Do you have sudden and severe postponed urination and increased frequency of urination?, Do you have involuntary UI while laughing, sneezing, exercising, walking and coughing?, Do you have urgency and stress UI at the same time? (4,10,11).

Data Collection Technique and Tools: Data were collected using face-to-face interviews during home visits. A survey form, I-QOL, SMMT and SMMT-E were used. The survey form was developed by the investigators to determine sociodemographic, fertility and UI features.

I-QOL was used to determine the quality of life in UI patients. This scale was developed by Patrick et al. (12) in order to determine the quality of life in UI patients. The scale consists of a total of 22 questions with three subdimensions. The subdimensions are avoidance and limiting behaviours, psychosocial impact and social embarrassment. All I-QOL items are evaluated with five-item Likert type answers (1= very much, 2= quite, 3= moderate, 4= some, 5= none). The validity and reliability of I-QOL in our country have been shown by Ozerdogan et al (4). The Cronbach Alfa coefficient of I-QOL was found to be 0.96 in general, 0.88 for the avoidance and limiting behaviours subdimension, 0.92 for the psychosocial impact subdimension and 0.88 for the social embarrassment subdimension. In our study the Cronbach Alfa coefficient of I-QOL was found to be 0.94 in general, 0.80 for the avoidance and limiting behaviours subdimension, 0.88 for the psychosocial impact subdimension and 0.85 for the social embarrassment subdimension. Expert views were obtained regarding the conduct of the validity study. High scores show a better quality of life (12).

SMMT and SMMT-E provide information on the degree of cognitive disorder (13). The test was developed for the purpose of short-term cognitive assessment, especially in the examination of delirium or dementia in elderly individuals. The lowest score that can be received on the scale is 0 and the highest score is 30. A score from 0-12 indicates “severe”, 13-22 “moderate”, and 23-24 “mild cognitive disorder present,” and 25-30 indicates “cognitive disorder not present”. The validity and reliability study of SMMT and SMMT-E was conducted by Gungen et al (14). Before the study applied the survey form to 10 pilot elderly and than can not be understood of expression in the form has been identified and revised.

Statistical Analyses: The data were evaluated using the Statistical Package for the Social Sciences (SPSS) 15.0 programme. Descriptive data were presented as percentage and mean ± standard deviation (SD). Chi-square, Mann-Whitney U (MW-U) tests, the Kruskal-Wallis Variance (KW) and Bonferroni-corrected MW-U analysis (for KW test) were used to determine UI status and UI influence on quality of life because the data were not normally distributed. $p<0.0167$ and $p<0.0083$ values were considered significant in Bonferroni-corrected MW-U analysis, $p<0.05$ value was accepted significant in all other analysis.

Before the study was started, Ethical Committee consent was received from Selcuk University Medical Faculty and the related permissions were obtained from the Health Group Head Office of the region where the study took place, and from the elderly people within the study population.

RESULTS

Socio-demographic and urinary incontinence features of the subjects are presented in Table 1. The rate of subjects experiencing UI in the past year was 47.8% (128) and the most common type was mixed (51.6%). UI had been experienced a couple of times a day by 51.6% of the subjects while 58.6% had UI in large amounts.

We found that 64.8% of the subjects with UI had not gone to see a physician for this problem, 63.9% did not care, and 48.2% were not ashamed of it. Kegel exercises were unfamiliar to 99.3% of the subjects and none had performed them.

Urinary incontinence risk was higher in those in the 80 years and over group, subjects who perceived their economic condition as poor, had a birth number of 1-2, had given birth five times or more, or had bladder prolapse; these differences were statistically significant ($p<0.05$). Yates correction test was used on having experienced a twin pregnancy, bladder prolapse and episiotomy. There was no statistically significant relationship between UI and educational status, age at last birth, having experienced a twin pregnancy and episiotomy status ($p>0.05$) (Table 2).

Table 3 shows that subjects with a better perceived economic status had higher mean scores than those with perceived poor economic status for avoidance and limiting behaviours, psychosocial impact, social embarrassment and total I-QOL score; this was statistically significant ($p<0.05$). The Bonferroni-corrected MW-U analysis showed the richest group different from the other two groups and the poorest groups having low I-QOL points ($p<0,0167$). Mean I-QOL total and social embarrassment subdimension scores were higher for

Table 1— Distribution of Socio-Demographic and Urinary Incontinence-Related Features in The Elderly.

Characteristics	n	%
Age (n=268)		
65-69	114	42.5
70-74	64	23.9
75-79	43	16.0
≥80	47	17.5
Educational Status (n=268)		
Illiterate	159	59.3
Literate	38	14.2
Primary school or over	71	26.5
Perceived Economic Status (n=268)		
Good	19	7.1
Moderate	180	67.2
Poor	69	25.7
Urinary Incontinence Status (n=268)		
Yes	128	47.8
No	140	52.2
Urinary Incontinence Type (n=128)		
Urgency	50	39.0
Stress	12	9.4
Mixed	66	51.6
Urinary Incontinence Frequency (n=128)		
Once a day	66	51.6
A couple of times a week	47	36.7
A couple of times a month	15	11.7
Urinary Incontinence Amount (n=128)		
Small amount (a few drops)	34	26.6
Moderate amount (diaper or underwear becoming humid)	19	14.8
Large amount (diaper or underwear becoming wet)	75	58.6

subjects who had last given birth at the age of 39 or younger, than for those who had given birth at the age of 40 or older ($p<0.05$). I-QOL mean social embarrassment scores of subjects who had not experienced twin pregnancy were higher than scores of those who had ($p<0.05$), and I-QOL mean scores of subjects who had bladder prolapse were lower than those who did not have bladder prolapse ($p<0.05$). No statistically significant difference was found in mean I-QOL scores with respect to age, educational status, birth number and presence of episiotomy ($p>0.05$).

The mean scores of the study subjects were 45.58±18.48 for total I-QOL score, 41.04±16.63 for avoidance and limiting behaviours, 51.82 ±20.06 for psychosocial impact, and 41.59±22.61 for social embarrassment.

Table 4 shows a statistically significant relationship between UI type, frequency, amount and mean I-QOL subdimension and total scores; the daily number of underwear changes and mean I-QOL avoidance and limiting behaviours, social embarrassment and total scores; and micturition frequency and mean I-QOL avoidance and limiting behaviours, psychosocial impact and total scores ($p<0.05$). Bonferroni-corrected MW-U analysis revealed that the groups with mixed type UI, once a day UI and large amounts of UI had different and negative characteristics in terms of I-QOL points than the other groups ($p<0,0167$). Bonferroni-corrected MW-U analysis revealed that the I-QOL points was highest in the group that changed underwear once a day and lowest in the group that changed underwear four times or more a day

Table 2— Distribution of Risk Factors for Urinary Incontinence (n=268).

	Urinary Incontinence Status		
Features	**Present n (%)**	**Absent n (%)**	**Significance Test**
Age			
65-69	48 (42.1)	66 (57.9)	
70-74	29 (45.3)	35 (54.7)	X^2=14.162
75-79	17 (39.5)	26 (60.5)	*p=0.03
≥80	34 (72.3)	13 (27.7)	
Perceived Economic Status			
Good	6 (31.6)	13 (68.4)	X2=8.937
Moderate	79 (43.9)	101 (56.1)	*p=0.011
Poor	43 (62.3)	26 (37.7)	
Educational Status			
Illiterate	77 (48.4)	82 (51.6)	X2=0.868
Literate	20 (52.6)	18 (47.4)	p=0.648
Primary school and higher	31 (43.7)	40 (56.3)	
Age at Last Birth			
39 years and ?	98 (48,5)	104 (51,5)	X2=0,030
40 years and ?	25 (47,2)	28 (52,8)	p=0,862
Birth Number			
1-2 births	15 (75.0)	5 (25.0)	
3 births	14 (34.1)	27 (65.9)	X2=11.366
4 births	20 (39.2)	31 (60.8)	*p=0.010
5 births or more	74 (51.7)	69 (48.3)	
Having Experienced a Twin Pregnancy			
Yes	11 (73.3)	4 (26.7)	X2=3.024
No	112 (46.7)	128 (53.3)	p=0.082
Bladder Prolapse			
Yes	16 (80.0)	4 (20.4)	X2=7.661
No	112 (45.2)	136 (54.8)	*p=0.006
Presence of Episiotomy			
Yes	7 (53.8)	6 (46.2)	X2=0.017
No	116 (47.9)	126 (52.1)	p=0.896

*p<0.05

(p<0,0083). Bonferroni-corrected MW-U analysis also revealed that the group that performed micturition twice a night had the highest and the group that performed micturition five or more times a night the lowest I-QOL points (p<0,0167). No statistically significant relationship was found between the status of having UTI in the last year and I-QOL mean score (p>0.05).

The mean I-QOL avoidance and limiting behaviours, psychosocial impact and total scores of subjects who had presented to their physicians with UI were lower than the scores of those who had not, and the difference between the groups was statistically significant (p<0.05).

Discussion

In the first section of the discussion is given to the relationship between UI status and some independent variables. In our study, the percentage of elderly women who had experienced UI in the last year was 47.8%. Prevalence of UI was reported between 27.0% and 68.9% in abroad study (15-17). In studies performed in our country, UI frequency was found to

Table 3— Distribution of Mean I-QOL Total and Subdimensional Scores According to Specific Variables (**n=128).

I-QOL	Avoidance and Limiting Behaviours	Psychosocial Impact	Social Embarrassment	Total I-QOL
Perceived Economic Status	Mean±SD	Mean±SD	Mean±SD	Mean±SD
Good***	59.58±22.21	75.19±22.10	67.33±23.92	67.73±21.25
Moderate	41.68±16.90	52.43±20.25	42.73±22.95	46.32±18.60
Bad	37.27±13.51	47.44±17.30	35.91±19.23	41.12±15.65
Significance Test	**KW=6.040**	**KW=7.373**	**KW=9.352**	**KW=8.088**
	***p=0.049**	***p=0.025**	***p=0.009**	***p=0.018**
Age at Last Birth				
39 years and ↓	41.84±16.01	53.38±19.70	42.94±21.83	46.81±17.85
40 years and ↑	37.40±18.92	46.67±21.70	35.68±23.69	40.80±20.49
Significance Test	Z=-1.761	Z=-1.932	**Z=-2.100**	**Z=-1.977**
	p=0.078	p=0.053	***p=0.036**	***p=0.048**
Number of Births				
1-2	42,67±18,18	53,78±19,37	46,40±24,36	48,06±19,23
3	45,36±14,17	56,83±20,67	43,71±21,25	49,68±16,78
4	38,50±17,47	50,78±21,94	40,80±21,07	44,05±19,38
≥5	40,41±16,70	51,08±20,08	40,22±22,68	44,73±18,61
Significance Test	KW=3,231	KW=2,020	KW=1,395	KW=2,148
	p=0,357	p=0,568	p=0,707	p=0,542
Twin Pregnancy Experience				
Yes	34.32±15.29	43.43±21.23	29.82±16.33	37.02±17.35
No	41.58±16.71	52.86±20.01	42.61±22.54	46.43±18.45
Significance Test	Z=-1.479	Z=-1.873	**Z=-2.037**	Z=-1.831
	p=0.139	p=0.061	***p=0.042**	p=0.067
Bladder Prolapse				
Yes	33.28±11.99	41.81±14.81	30.25±12.64	36.08±12.41
No	42.14±16.94	53.25±20.36	43.21±23.29	46.93±18.84
Significance Test	**Z=-2.007**	**Z=-2.136**	**Z=-1.977**	**Z=-2.296**
	***p=0.045**	***p=0.033p**	***p=0.048**	***p=0.022**
Presence of Episiotomy				
Yes	43,57±14,56	62,54±17,79	49,71±21,89	52,73±16,84
No	40,78±16,82	51,38±20,24	40,97±22,33	45,16±18,56
Significance Test	Z=-0,739	Z=-1,580	Z=-1,365	Z=-1,305
	p=0,460	p=0,114	p=0,172	p=0,192

*p<0.05
**(n:128 having UI)
***(Different group)

be between 16.4% and 68.8% (3,9,11,18-21). Our study results are similar to studies performed both abroad and in our country. These findings show that UI is a common problem in the elderly and we can therefore conclude it is an important healthcare issue in this age group.

Urinary incontinence prevalence was higher in the group of elderly people aged 80 or over than in the group aged 65-69. Aggazzotti et al. (1) reported that UI prevalence increased significantly with age: UI prevalence was 26.5% for subjects aged 65 or over but 73.7% for those aged 95 or over. The other study (3,10,11,15,21), reported a significant relationship between age and UI prevalence. Studies from our country and others support our finding that advanced age increases UI prevalence.

Table 4— Distribution of Mean I-QOL Total and Subdimension Scores According to UI-Related Features (n=128).

I-QOL	Avoidance and Limiting Behaviours	Psychosocial Impact	Social Embarrassment	Total I-QOL
Incontinence Type	Mean±SD	Mean±SD	Mean±SD	Mean±SD
Urgency	45,15±17,19	54,31±22,83	46,16±25,66	49,13±20,51
Stress	52.92±15.62	70.37±17.40	58.33±22.72	61.29±16.43
Mixed***	35.76±14,.45	46.57±15,.69	35.09±17.46	40.03±14.76
Significance Test	**KW=17.425**	**KW=13.455**	**KW=11.040**	**KW=15.282**
	****p=0.000**	****p=0.001**	****p=0.004**	****p=0.000**
Incontinence Frequency				
Once a month	54.00±15.69	66.67±17.35	59.20±23.38	60.36±17.19
Once a week	45.11±18.73	58.30±20.44	46.30±23.95	50.77±19.61
Once a day	35.19±12.39	43.84±16.74	34.24±18.25	38.51±14.51
Significance Test	**KW=18.393**	**KW=25.596**	**KW=17.125**	**KW=24.038**
	****p=0.000**	****p=0.000**	****p=0.000**	****p=0.000**
Incontinence Amount				
Small	54.49±17.76	66,47±19,60	56.47±25.08	59.84±9.08
Moderate	45.92±13.95	60.00±17.45	52.00±18.18	53.06±15.41
Large	33.70±11.95	43.11±15.90	32.21±17.27	37.21±13.68
Significance Test	**KW=37.013**	**KW=36.056**	**KW=34.798**	**KW=40.490**
	****p=0.000**	****p=0.000**	****p=0.000**	****p=0.000**
Underwear Change Number				
Once***	38.13±14.81	50.90±18.94	42.50±22.69	44.35±17.05
Twice	34.82±13.28	41.59±18.25	30.00±17.09	36.49±15.39
Three times	38.17±15.96	47.41±21.35	36.80±21.97	41.64±18.78
Four times or more	25.94±7.06	34.17±7.69	24.00±5.65	28.86±5.86
Significance Test	**KW=7.859**	**KW=7.047**	**KW=8.056**	**KW=9.561**
	***p=0.049**	**p=0.070**	***p=0.045**	***p=0.023**
Night Micturition Frequency				
Once	45.43±17.48	55.71±20.89	44.83±23.81	49.50±19.33
Twice***	48.25±17.69	58.67±17.38	46.60±21.41	52.14±17.31
Three times	39.32±15.23	51.92±19.56	40.97±20.47	44.85±17.51
Four times	37.08±14.35	48.40±21.37	40.00±24.96	42.37±18.31
Five times and more	31.63±11.49	42.32±17.54	33.04±20.89	36.32±15.51
Significance Test	**KW=15.746**	**KW=11.91**	**KW=8.152**	**KW=14.107**
	****p=0.003**	***p=0.018**	**p=0.086**	****p=0.007**
Having a UTI				
Yes	40.38±16.71	49.62±19.04	38.63±20.49	43.76±17.63
No	41.91±16.63	54.75±21.17	45.53±24.80	47.98±19.45
Significance Test	Z=-0.608	Z=-1.364	Z=-1.453	Z=-1.240
	p=0.543	p=0.172	p=0.146	p=0.215

*p<0.05
**p<0.01
***(Different group)

In our study the UI prevalence found to be higher in patients who perceive their economic condition as poor than in patients who perceive their economic condition as good. No similar economic data were found in other studies regarding UI. Poor socioeconomic status effects negatively the healthy lifestyle behaviors and quality of life (22). Poor economic conditions may affect the demand for protecting and improving the elderly person's own health and in this way the prevalence of UI will increase.

Urinary incontinence prevalence was found to be significantly related that both the number of births and bladder prolapse status. The number of births increases UI prevalence (1,10,11,19,21). However, Ilce and Ayhan (23) reported that there was no significant relationship between UI prevalence and number of births. While studies generally report that a high number of births is a risk factor for UI, our study does not conform with these results. In this study, we thought birth type was not related factor on the number of births because only two elderly had cesarean section. The elderly could have been performed hard labor or had high body mass index (BMI) who had 1-2 births. They couldn't want to another pregnancy due to this traumatic labor. BMI could be important factor on the number of births and UI. To clarify the relationship between number of births and UI are necessary more detailed studies. In our study, UI was seen more frequently in elderly people who had bladder prolapse. According to a report by the NIH Consensus Conference on Urinary and Fecal Incontinence in Adults, number of births and prolapse increase the risk of UI (24). The prevalence of UI in subjects who had a lot of birth number can be considered to increase in later stages due to the increasing pressure on the bladder by increased abdominal pressure and bladder prolapse.

In our study, there was no statistically significant relationship between UI and age at last birth and episiotomy status. Bilgili et al. (9) studies support our finding that age at last birth and episiotomy status unrelated UI status.

In the second section of the discussion is given to the relationship between I-QOL scores and some independent variables (perceived economic condition, age at last birth, twin pregnancy, bladder prolapse, UI frequency and amount, UI type, number of underwear changes and nighttime micturition and UI presentation).

Perceived economic condition was found to be significantly related to mean I-QOL scores of the elderly. Quality of life was higher for elderly women who perceived their economic condition as good than for those who perceived their economic condition as poor. Our study results indicate that UI-related quality of life is lower in people whose economic condition is poor.

When the relationship between I-QOL mean scores and fertility features was evaluated, we found the mean I-QOL total and social embarrassment subdimension scores to be higher in subjects who had, of 39 or under, compared to those who had last given birth at the age of 40 or over. Giving birth to the last child at the age of 40 or over had a significantly negative effect on UI-related quality of life.

We found a statistically significant relationship between experiencing a twin pregnancy and mean I-QOL social embarrassment scores. There was also a statistically significant relationship between having had bladder prolapse and mean I-QOL scores. We found no other studies on the relationship between I-QOL and twin pregnancies or bladder prolapse. We found the UI-related quality of life to be lower in subjects who had twin pregnancies or bladder prolapse.

I-QOL mean scores were higher in the subjects with a lower amount of UI. Ozerdogan et al. (4) reported a negative relationship between quality of life and UI frequency and amount. Our study results indicate that increased UI frequency and amount negatively influence UI-related quality of life.

There was a statistically significant relationship between UI type and mean I-QOL subdimension and total scores in our study. Mean I-QOL scores of the elderly subjects who had stress type UI were higher than those with mixed type UI. Ozerdogan et al. (4) reported a statistically significant relationship between the quality of life of individuals and UI type, with females suffering from stress UI having a higher quality of life than those with other types of UI. Accordingly, quality of life can be said to be highest in those with stress UI.

A high number of underwear changes was found to negatively affect mean avoidance and limiting behaviors, social embarrassment and I-QOL total scores. Kocak et al. (25) reported that 62.4% of females with UI had at least one complaint regarding their social life and that the anxiety level was high in women using pads or protectors due to the severity of UI. We found a statistically significant relationship between the frequency of nighttime micturition and mean psychosocial impact and I-QOL total scores. Mean I-QOL scores of elderly subjects who performed micturition 5 times or more a night were lower than those reporting this just once a night. These results indicate that the increased number of underwear changes and nighttime micturition due to UI severity adversely affect the quality of life.

In our study a statistically significant relationship occurred between the presentation of elderly women to their physi-

cians for UI and mean I-QOL avoidance and limiting behaviours, psychosocial impact and I-QOL total scores. Minassian et al. (10) reported that although UI negatively affected the quality of life of individuals, none of them sought medical aid. Studies have shown that UI is not perceived as a problem and the rate of presentation to physicians for this symptom is low.

In conclusion, UI is quite common in Turkish women aged 65 or over. Advanced age and lower economic status increase the prevalence of UI.

Mean I-QOL scores vary depending on the UI type and amount, daily underwear changes and the number of night micturitions. Although UI is common and affects the quality of life negatively, the rate of presentation at the physician is low. Accordingly, physicians and nurses and especially those working in primary care should inform the elderly and their relatives about UI development, risks and complications. The healthcare staff should persuade them to present at the physician when necessary and observe those in the risk groups carefully in terms of UI prevalence.

We suggest that the elderly who had poor perceived economic condition, aged 80 years and older, twin pregnancy, bladder prolapse seen in terms of the UI to be taken into account in the risk group and more closely monitoring by physicians and nurses.

For the elderly to reduce the frequency of urination at night; fluid intake, with caffeine and alcohol beverages should be told to limit.

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Özgül AKIN ŞENKAL[1]
Ayşen KÖSE[2]
Songül AKSOY[3]

RESEARCH

ASSESSMENT OF GERIATRIC PATIENTS' SATISFACTION ON HEARING AIDS AND THEIR INFLUENCE ON QUALITY OF LIFE

ABSTRACT

Introduction: The use of hearing aids is one of the few efficient solutions for hearing loss in the elderly; modern hearing aids are effective in minimizing the negative consequences of hearing loss in daily functioning.

Materials and Method: This study used the Short Form-36 Quality of Life survey to determine the effects of hearing aid use on the short-term general well-being of persons aged 65 and older with sensorineural or mixed type hearing loss. Satisfaction with hearing aid use was evaluated using the Abbreviated Profile of Hearing Aid Benefit survey.

Results: Hearing aids not only increased communicative ability, but also boosted self-confidence. A unilateral hearing aid was found to be 75% useful in quiet places where communication was easy. An overall assessment of the Short Form -36 Quality of Life (SF-36) survey of the unilateral hearing aid users did not reveal any significant effect of the duration of hearing aid use on quality of life (p>0.05).

Conclusion: In order to increase the level of satisfaction with hearing aids, the use of binaural aids should be supported. Depending on the degree of hearing loss, geriatric individuals may need to get professional help when using hearing assistance devices (for environmental factors). The International Classification of Functioning framework can provide a holistic perspective on the evaluation of hearing aid use of the elderly. Therefore, it is recommended that valid surveys be adapted for use with geriatric individuals.

Key Words: Geriatrics; Hearing Aids; Correction of Hearing Impairment; Personal Satisfaction.

ARAŞTIRMA

GERİATRİK HASTALARIN İŞİTME CİHAZI MEMNUNİYETİNİN VE CİHAZLARIN YAŞAM KALİTESİNE ETKİSİNİN İNCELENMESİ

ÖZ

Giriş: Yaşlılıkta işitme cihazları tedavi için bir seçenektir ve modern işitme cihazları da yaşlı bireylerin günlük fonksiyonlarında işitme kaybının negatif etkilerini azaltmakta etkilidir.

Gereç ve Yöntem: Bu çalışmada sensörinöral veya mikst tipte işitme kaybı olan 65 yaş ve üzeri işitme cihazı kullanan kişilerde Kısa Form- 36 Yaşam Kalitesi ölçeği ile işitme cihazı kullanımının kısa dönemde genel sağlık üzerine yaptığı etkiler belirlenmiştir ve Abbreviated Profile of Hearing Aid Benefit- Türkçe anketi ile işitme cihazı memnuniyeti değerlendirilmiştir.

Bulgular: İşitme cihazı kullanımı iletişim yeteneğini arttırırken, özgüveni sağlamlaştırmaktadır. unilateral işitme cihazı kullanımı % 75 sessiz ve iletişimin kolay sağlanabildiği ortamlarda fayda sağlamıştır. Arka plan gürültünün varlığında unilateral işitme cihazı kullanımı %63 konuşmanın anlaşılırlığında fayda sağlarken, işitme cihazının kullanılmadığı durumlarda oran %51 olmaktadır ve bu fark istatistiksel olarak anlamlı değildir (p=0.31). Kısa Form- 36 Yaşam Kalitesi Anketi'nin unilateral işitme cihazı kullanıcılarında genel değerlendirilmesinde, işitme cihazı kullanım süresinin yaşam kalitesi üzerine istatistiksel olarak etkisi bulunmamıştır (p<0.05).

Sonuç: İşitme cihazından memnuniyetin arttırılması için yine de binaural işitme cihazı uygulamalarının desteklenmesi gerekmektedir. İşitme kaybının derecesine bağlı olarak yardımcı dinleme cihazları (çevresel etmenler) için profesyonel yardım almaları gerekliliği vardır. Yaşlı bireylerdeki işitme cihazı uygulamalarında International Classification of Functioning çerçevesi ile holistik bir bakış açısı sağlanabilmektedir. Bu nedenle geçerli anket uygulamalarının geliştirilerek geriatrik bireyler için uyarlanması önerilmektedir.

Anahtar Sözcükler: Yaşlılık; İşitme Cihazı; Odyolojik Rehabilitasyon; Kişisel Memnuniyet.

İletişim *(Correspondance)*

Özgül AKIN ŞENKAL
Başkent Üniversitesi Tıp Fakültesi Kulak Burun Boğaz Anabilim Dalı ADANA

Tlf: 0322 235 80 80
e-posta: oakinsenkal@yahoo.com

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(Accepted)

[1] Başkent Üniversitesi Tıp Fakültesi Kulak Burun Boğaz Anabilim Dalı ADANA
[2] Ankara Üniversitesi Sağlık Hizmetleri Meslek Yüksekokulu ANKARA
[3] Hacettepe Üniversitesi Sağlık Bilimleri Fakültesi ANKARA

INTRODUCTION

Communication is an essential tool of daily life for all age groups. The most common cause of communicative disorders in children and adults alike are hearing loss. Hearing loss not only decreases the ability to understand and differentiate speech, but also restricts the person's communication, depending on the person's age of diagnosis, and type, degree and configuration of hearing loss. Communication skills start deteriorating due to hearing loss, particularly when it is associated with ageing. This deterioration leads to a decline in quality of life. However, using a hearing aid enhances both auditory perception and quality of life (1,2).

Symmetrical sensorineural hearing loss particularly affects the audition of sounds at higher frequencies due to biological ageing, and is referred to as presbycusis. Some researchers take presbycusis to mean hearing loss caused by degenerative changes brought about by ageing.

The onset and rate of progression of hearing loss varies; it is not only impairment as it relates to hearing that is important, but also perception and coding centres and how these relate to one another (3). Schuknecht (4) defines four types of presbycusis in relation to selective atrophy of different morphological structures in the cochlea; Sensory presbycusis, neural presbycusis, strial presbycusis, and cochlear conductive presbycusis.

Presbycusis starts to affect the hearing of sounds at lower frequencies as time progresses. In addition to the effects of ageing on the auditory system and age-related degenerative structures, external factors such as noise, cardiovascular disease and stress can also lead to hearing loss.

Recent studies designed to evaluate the effects of hearing-aid use employ not only audiological assessments, but also surveys. This new trend can be attributed to the need to increasing the quality of individual-oriented services.

The performance of hearing aids in patients with sensorineural hearing loss is a significant determiner of quality of life. Selecting the ideal hearing aid for these patients is a major step in auditory rehabilitation. The ideal hearing aid should help the patient regain frequencies below their hearing level. When the performance expected from hearing aids is evaluated or patients using a hearing aid are monitored, subjective evaluations, audiological examinations and survey methods are commonly used (5-7).

Bilateral hearing aids are commonly prescribed for patients with presbycusis, but it is often preferred to use a single hearing aid for patients for economic or aesthetic reasons. In addition, public health institutions that provide hearing aids may only issue unilateral hearing aid. Cosmetic appeal is still a concern for many with hearing impairments, and these patients often prefer one hearing aid as it is perceived as more discreet than two.

Since the elderly populations in developing countries are growing, ageing represents a high-priority issue for the World Health Organization. This provides grounds for investigating problems caused by hearing loss in older people by examining a number of factors within the framework of the International Classification of Functioning, Disability and Health (ICF) (8). Evaluation of hearing rehabilitation and the resultant changes in quality of life promotes cooperation between audiology and geriatric departments. This study aimed to determine the quality of life and satisfaction with one hearing aid (unilateral) of individuals age 65 and older who had used their device for eight hours or more per day over a period of at least 24 months. Results were interpreted using the ICF framework. This is the first study in a homogeneous group who use unilateral hearing aid and satisfaction in ICF framework.

The overall aim of the ICF is to provide a common, standard language and framework for describing health and health-related conditions (Figure 1). The ICF belongs to the international family of classifications developed by the World Health Organization (WHO) for use in as many areas of health as possible. This common, standard language enables worldwide communication related to health and medical care between various disciplines and scientific fields. The ICF is also a standard tool used to share knowledge and experience, and to ensure successful assessment and treatment, of voice disorders in school age children who pose particular challenges for the evaluation and therapy processes.

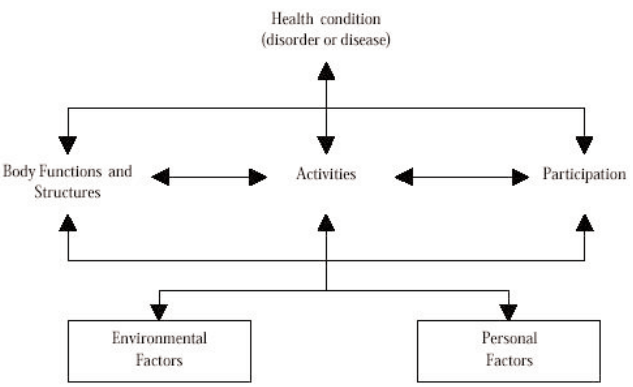


Figure 1— Conceptual framework of ICF.

Table 1— Demographic Data

Gender	n	Age (year)	Pure Tone Average (dB)	Daily Use of Hearing Aids (hours)	Total Period of Hearing Aid Use (months)	Length of Hearing Loss (months)
Female	29	71.8±12.2	56.23±8.3	10.5±2.2	31.3±6.07	33.8±12.08
Male	35	73.74±10.2	56.9±8.9	9.45±1.8	27.8±5.5	36.08±13.8
Total	64	73.11±7.3	56.71±8.7	9.8±1.98	29.42±6.11	35.07±11.8

Materials and Method

The study was carried out with individuals aged 65 and older who had been prescribed a hearing aid for hearing loss. Informed consent of all individuals was obtained before participation in the study. The study began with 100 geriatric individuals: 64 who had mild degree mixed or sensorineural hearing loss and who used a unilateral digital hearing aid comprising Wide Dynamic Range Compression (WDRC) technology for at least eight hours a day over a period of at least 24 months were included in the final evaluation (Table 1). This usage criterion allowed for a hearing aid adaptation period. Individuals using a unilateral hearing aid were chosen because currently, geriatric individuals can commonly afford to use only one device. Patients were informed about the objectives of the study, which was carried out in accordance with the Helsinki Declaration and was approved by the Ethical Committee of Ankara University with the decree dated 09/05/2013 and numbered 148/764.

The average daily duration of hearing aid use by individuals was 9.8±3.04 hours. The mean age of participants was 73.11±7.3 and the mean pure-tone hearing threshold (PTA) was 56.71±10.01 dB. Of the 64 participants, 29 were females and 35 were males (Table 1).

The following subjective tests were used to evaluate participants' quality of life and to determine their degree of satisfaction with the hearing aid:

a. SF-36 Quality of Life Scoring Scale (9). SF-36 is a self-assessment scale developed by Ware (1992). Its validity and reliability have been studied by Koçyiğit et al. (2006). The scale consists of a total of 36 questions in eight subscales: physical functioning, role limitations due to physical problems, bodily pain, general health perceptions, vitality, social functioning, role limitations due to emotional problems, and mental health. The SF-36 evaluates both the negative and positive aspects of one's general health. Scores on the subscales range between 0 and 100, with higher scores indicating a better condition (10).

b. Abbreviated Profile of Hearing Aid Benefit (APHAB), Turkish Version

The APHAB is an inventory that collects information about how hearing disability affects daily life. It evaluates the problems that an individual encounters in a variety of listening environments during the course of the day (11-13).

The data obtained using the Turkish APHAB was examined in relation to ICF categories. The relationship between the APHAB results and the results obtained from the SF-36 quality of life survey was investigated.

Demographic data were evaluated using descriptive statistics and expressed as means and standard deviations. T-tests were used for parametric variables, and the Wilcoxon Paired Samples Test was used for non-parametric comparisons. Correlations were calculated using Spearman's rho. The level of statistical significance was set at $p<0.05$. Data were analysed using MedCalc 9.2.0.1 software.

Results

Satisfaction with a unilateral hearing aid was assessed on the four different subsections of the APHAB Form A. A unilateral hearing aid was found to be 75% useful in quiet places where communication was easy. This rate dropped to 32% when the hearing aid was not used, and the difference between the two percentages was statistically significant ($p<0.05$). When there was background noise, the unilateral hearing aid was 63% useful in helping speech comprehension, while this rate dropped to 51% without the hearing aid; however, the difference was not statistically significant ($p=0.31$). In the presence of reverberation, speech comprehension was 61% with the hearing aid and 43% without, again displaying a non-significant difference ($p=0.33$). In addition, use of the unilateral hearing aid allowed participants to ignore discomforting sounds at a rate of 42%, whereas without the hearing aid, they could only be ignored at a rate of 20%; this difference was statistically significant ($p<0.05$) (Figure 2).

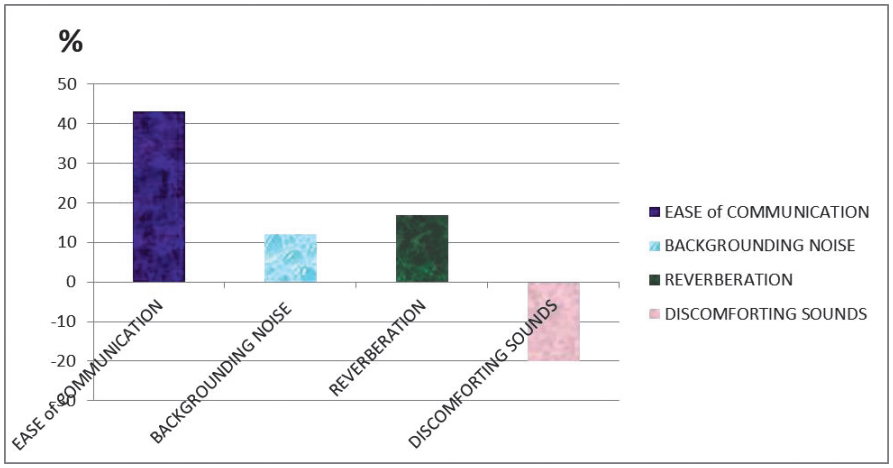


Figure 2— APHAB assessment results.

When APHAB survey questions were evaluated within the ICF framework, we found that the questions in all subsections of the survey were related to the ICF categories of "Activities and Participation" and "Body Functions" (Table 2).

Results of the SF-36 survey indicate that hearing aid use has a positive influence on quality of life. When the mean values of the SF-36 survey results of geriatric hearing aid users were considered, the values of social functioning, bodily pain and mental health, physical functioning, vitality, role limitations due to emotional problems and role limitations due to physical problems in unilateral hearing aid users were obtained (Figure 3).

An overall assessment of the SF-36 survey of the unilateral hearing aid users did not reveal any significant effect of the duration of hearing aid use on quality of life ($p>0.05$).

Discussion

The worldwide ratio of hearing aid use for individuals over 65 years of age was 48.7% in the 1980s and 13% for individuals between 40 and 65 years of age in 1998. In 1997 in the U.S., about 8% of individuals aged 65 or over used a hearing aid (13, 14). Although hearing loss increases with age, the rate of hearing aid use in Turkey has remained relatively low.

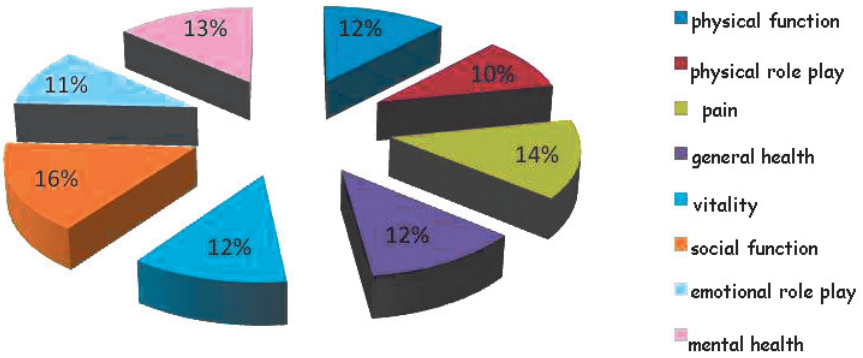


Figure 3— SF-36 Assessment results.

Table 2— APHAB Survey Questions According to ICF Tags and Frequency of Complaints.

APHAB Survey Questions	Categories and Tag of ICF	Frequency of Complaints (%)	
		Without Hearing Aid	Unilateral Hearing Aid
Ease of Communication Scale			
4. I have difficulty hearing a conversation when I'm with one of my family at home.	d310 communicate through verbal communication, b2304 speech discrimination	79.0	33.0
10. When I am in a small office, interviewing or answering questions, I have difficulty following the conversation.	d310 communicate through verbal communication, b2304 speech discrimination	67.0	31.0
12. When I am having a quiet conversation with a friend, I have difficulty understanding.	d310 communicate through verbal communication, b2304 speech discrimination	70.0	29.0
14. When a speaker is addressing a small group and everyone is listening quietly, I have to strain to understand.	d310 communicate through verbal communication, b2304 speech discrimination	79.0	29.0
15. When I'm having a quiet conversation with my doctor in an examination room, it is hard to follow the conversation.	d310 communicate through verbal communication, b2304 speech discrimination	75.0	27.0
23. I have to ask people to repeat themselves in one-on-one conversations in a quiet room.	d310 communicate through verbal communication, b2304 speech discrimination	78.0	32.0
Background Noise Scale			
1. When I am in a crowded grocery store and talking with the cashier, I can follow the conversation.	d310 communicate through verbal communication, b2304 speech discrimination	20.0	49.0
6. When I am listening to the news on the car radio and family members are talking, I have trouble hearing the news.	d115 listening, b230hearing functions, d310 communicate through verbal communication, d9208 recreation and leisure, other specified	80.0	51.0
7. When I'm at the dinner table with several people and am trying to have a conversation with one person, understanding speech is difficult.	d310 communicate through verbal communication, d9205 socializing, b2304 speech discrimination	81.0	43.0
16. I can understand conversations even when several people are talking.	d310 communicate through verbal communication, d350 conversation, b2304 speech discrimination	68.0	49.0
19. I can communicate with others when we are in a crowd.	d310 communicate through verbal communication, d350 conversation, b2304speech discrimination	79.0	44.0
24. I have trouble understanding others when an air conditioner or fan is on.	b230 hearing functions, d310 communicate through verbal communication, b2304 speech discrimination	49.0	69.0
Reverberation Scale		Not valid	Not valid
2. I miss a lot of information when I'm listening to a lecture.	d115 listening, b2304 speech discrimination		
5. I have trouble understanding the dialogue in a movie or at the theatre.	d9208 Recreation and leisure, other specified, b2304 speech discrimination, d115 listening	80.0	51.0

Continued

Table 2— APHAB Survey Questions According to ICF Tags and Frequency of Complaints.—*Continued*

APHAB Survey Questions	Categories and Tag of ICF	Frequency of Complaints (%)	
		Without Hearing Aid	Unilateral Hearing Aid
9. When I am talking with someone across a large empty room, I understand the words.	d3503 conversation, one to one, b2304 speech discrimination	58.0	33.0
11. When I am in a theatre watching a movie or play and the people around me are whispering and rustling paper wrappers, I can still make out the dialogue.	b2304 speech discrimination, d920 recreation and leisure	35.0	49.0
18. It's hard for me to understand what is being said at lectures or mosque.	b2304 speech discrimination, d115 listening	81.0	39.0
21. I can follow the words of a sect leader when listening inside a mosque.	b2304 speech discrimination, d115 listening	27.0	63.0
Aversiveness Scale			
3. I miss a lot of information when I'm listening to a lecture.	b2703 Sensitivity to a noxious stimulus	20.0	40.0
8. Traffic noises are too loud.	b2703 Sensitivity to a noxious stimulus	20.0	49.0
13. The sounds of running water, such as a toilet or shower, are uncomfortably loud.	b2703 Sensitivity to a noxious stimulus	20.0	30.0
17. The sounds of construction work are uncomfortably loud.	b2703 Sensitivity to a noxious stimulus	20.0	45.0
20. The sound of a fire engine siren close by is so loud that I need to cover my ears.	b2703 Sensitivity to a noxious stimulus	20.0	47.0
22. The sound of screeching tires is uncomfortably loud.	b2703 Sensitivity to a noxious stimulus	20.0	39.0
Mean score evaluations (%)	ACTIVITIES AND PARTICIPATION (d), BODY FUNCTIONS(b)	61.0	43.0

A study by Kahveci et al. (2011) found that 517 patients had been prescribed a hearing aid, but 58 (22%) did not use it (15). In a study that examined the effects of budgetary restrictions on the use of a hearing aid for presbycusis, Eşki and Yılmaz (2011) found that budgetary restrictions affected the choice of hearing aid (16). The same study also explored the effect of using a unilateral hearing aid for presbycusis on quality of life and patient satisfaction with the device. It was reported that hearing aid use had positive communicative and psychosocial effects in daily life and bolstered the elderly population's quality of life (17). Similarly, Acar et al. (2011) reported a significant improvement in the psychosocial and cognitive functions of geriatric individuals after three months of hearing aid use (1).

A hearing aid contributes positively to the communicative abilities of individuals from the moment they start using it. The present study also revealed that use of a unilateral hearing aid provided ease of communication in quiet places. The ability to understand speech in the presence of background noise, however, was found to be problematic, even with a unilateral hearing aid. It was also seen that the benefits of the hearing aid in helping patients understand speech in environments where there is reverberation were limited, while the effects of discomforting sounds could increase when a hearing aid was used.

When the Turkish version of Form A of the APHAB was considered in relation to the ICF Framework, we found that "Activities and Participation" and "Body Functions" were correlated with hearing aid satisfaction. However, the evaluation of hearing loss associated with presbycusis should not be based on only these two categories. Quality of life scales should also be used to include "Personal and Environmental Factors" in the evaluation. With these concerns in mind, SF-36 survey results in this study showed that unilateral hearing aid use did not have a considerable effect on quality of life. However, we know from the literature that hearing dysfunc-

tion negatively impacts individuals' quality of life, cognitive functions, emotional structure and habits. It has also been reported that personality changes might occur and social relations might be strained secondary to loss of hearing (15). In the present study, we found that there was a quantitative (statistically not significant) increase only in the social functions of individuals who used a unilateral hearing aid. Likewise, Stark and Hickson (2004) found a correlation between hearing loss and quality of life in their study, which showed that use of a hearing aid can curtail the negative effects of hearing loss on daily life (Activities and Participation) (18). Conversely, Hickson and Scarinci (2007) describe in their review that the complaints of geriatric individuals in the area of "Activities and Participation" had increased. Thus, they argue that hearing aids and hearing assistance products should be examined in the "Body Functions" (specific mental activities such as having to listen into their partners' social conversations as well as their own) part of the survey. However, with respect to rehabilitation of hearing loss, it is not enough to examine the "Body Functions and Structures" section only. The "Activities and Participation" section should also be addressed to assess the challenges facing the elderly in their daily life (8).

Brooks (1996) noted that geriatric individuals had a longer period of adaptation to hearing aids than younger users of the device (5). Therefore, geriatric individuals who are preparing to use a hearing aid should be provided with extensive adaptation and hearing rehabilitation services to bolster their use; this will not only facilitate communication, but also improve their quality of life. Additionally, to increase the level of satisfaction with the hearing aid, the use of binaural hearing aids should be supported. Depending on the degree of hearing loss, geriatric individuals may need to get professional help with hearing assistance devices (for environmental factors). The ICF framework can provide a holistic perspective in the evaluation of hearing aid use with the elderly. Therefore, it is recommended that valid surveys be adapted for use with geriatric individuals.

Hearing aid satisfaction and its effects on general health assessed with APHAB and SF-36 questionnaires in this study. There are similar studies in the literature, but the interpretation of these studies has not been integrated with the ICF. ICF compose a common and standard language in order to evaluate and understand situations about health.

This study was carried out using the 64 hearing-impaired individuals over 65 years with unilateral hearing aid. The sample group may be unable to represent all hearing impaired individuals in Turkey. However, individuals over 65 years of experience with hearing aids reveal. This study does not compare satisfaction of unilateral and bilateral hearing aids which can be considered as limitations of this study.

In bilateral hearing loss unilateral devices are commonly observed in clinical use. In this case there are economic and or aesthetic reasons. There are some restrictions of unilateral hearing aid use in background noise in terms of speech intelligibility. In order to eliminate this problem, bilateral hearing aids are preferred. Therefore, advantages of bilateral hearing aid have to explain to individuals with hearing impairment.

The use of hearing aids is important to ensure social communication. Therefore, using a hearing aid has a positive effect on quality of life. The benefits of the use of the device can be independent of time. Short or long-term use of hearing aids rather than the device being used is sufficient to improve the quality of life.

In future, a study with bilateral and unilateral use of hearing aids as a comparative study is expected.

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Fikriye YILMAZ[1]
Cansu ÇELİK[2]
Rukiye NUMANOĞLU TEKİN[1]

RESEARCH

INVESTIGATING THE EFFECTS OF POVERTY ON HEALTH AND QUALITY OF LIFE IN POOR PEOPLE AGED 65 AND OVER IN ETİMESGUT DISTRICT, ANKARA

ABSTRACT

Introduction: The purpose of this research was to examine the effects of poverty on health and quality of life of poor people aged 65 and over in Etimesgut District, Ankara.

Materials and Method: A questionnaire was administered to 116 people over the age of 65 who were deemed a priority group for assistance by the Etimesgut Social Assistance and Solidarity Foundation in Ankara. The questionnaire comprised questions related to socio-demographic characteristics, health status and health care utilization of elderly people, along with the World Health Organization Quality of Life Instrument-Older Adults Module. Research data were evaluated using the Chi-Square Test, Independent Samples T Test, One-Way Analysis of Variance, Mann-Whitney U Test and Kruskal-Wallis Test.

Results: The average monthly income of the elderly participants was 168.94±54.67 Turkish liras and they lived completely under the poverty line determined for Turkey. However, it was found that women, illiterate participants and those receiving the old age pension were poorer, and of those whose income was below average, more delayed/did not seek help when they were ill. Statistical analysis revealed that total quality of life scores of participants aged 65-74 and literate participants were higher; the "social participation" scores of participants whose income was below average and those received an old-age pension were lower.

Conclusion: Poverty has negative effects on the health status, health care utilization and quality of life of elderly people.

Key Words: Aged; Poverty; Health Status; Quality of Life.

ARAŞTIRMA

ANKARA ETİMESGUT İLÇESİNDE YAŞAYAN 65 YAŞ VE ÜZERİ YOKSUL BİREYLERDE YOKSULLUĞUN SAĞLIK VE YAŞAM KALİTESİ ÜZERİNE ETKİSİNİN İNCELENMESİ

ÖZ

Giriş: Bu araştırmanın amacı, Ankara Etimesgut İlçesinde yaşayan 65 yaş ve üzeri yoksul bireylerde yoksulluğun yaşlı sağlığı ve yaşam kalitesi üzerindeki etkisinin incelenmesidir.

Gereç ve Yöntem: Araştırmada, Ankara'da Etimesgut Sosyal Yardımlaşma ve Dayanışma Vakfı tarafından yardımlar için öncelikli olarak belirlenmiş 65 yaş ve üzeri 116 kişiye anket uygulanmıştır. Anket formu, yaşlıların sosyo-demografik özelliklerini, sağlık durumlarını ve sağlık hizmeti kullanımlarını belirlemeye yönelik sorular ile Dünya Sağlık Örgütü Yaşam Kalitesi Yaşlı Modülünden oluşmaktadır. Araştırma verileri Ki-Kare Testi, Bağımsız İki Örneklem T Testi, Tek Yönlü Varyans Analizi, Mann-Whitney U Testi ve Kruskal-Wallis Testi ile değerlendirilmiştir.

Bulgular: Araştırmaya katılan yaşlıların bir aylık ortalama gelirlerinin 168.94±54.67 Türk lirası olduğu ve Türkiye için belirlenmiş yoksulluk sınırının altında yaşadıkları belirlenmiştir. Bununla birlikte kadınların, okuryazar olmayanların, geçimini yaşlılık aylığı ile sağlayan yaşlıların daha yoksul olduğu ve sağlık hizmeti ihtiyaçlarını daha fazla erteledikleri bulunmuştur. Yapılan analizlerde, 65-74 yaş grubunun ve okuryazar olanların toplam yaşam kalitesi skorlarının daha yüksek olduğu, geliri ortalamanın altında olanların ve yaşlılık aylığı alanların da "sosyal katılım" alan skorlarının daha düşük olduğu belirlenmiştir.

Sonuç: Yaşlılarda yoksulluk sağlık, sağlık hizmeti kullanımı ve yaşam kalitesini olumsuz etkilemektedir.

Anahtar Sözcükler: Yaşlı; Yoksulluk; Sağlık Durumu; Yaşam Kalitesi.

İletişim *(Correspondance)*

Fikriye YILMAZ
Başkent Üniversitesi, Sağlık Kurumları İşletmeciliği Bölümü ANKARA

Tlf: 0312 246 66 66
e-posta: fyilmaz@baskent.edu.tr

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[1] Başkent Üniversitesi, Sağlık Kurumları İşletmeciliği Bölümü ANKARA
[2] Bayındır Ankara Hastanesi ANKARA

Introduction

Aging is a natural and inevitable process causing differences in the mental abilities, social capabilities and psychological condition of individuals who experience certain alterations in anatomical structure and physiological functions (1-2). As stated in the United Nations "World Population Ageing 2013" report, parallel to the global rise in life expectancy and decline in fertility rates, the proportion of people age 65 and over has been outpacing the proportion of other age groups (2). The rapid growth of the elderly population in all countries, including Turkey, is attributed to major achievements in medicine and public health. Nonetheless it is also defined as a demographic transformation that has introduced a number of difficulties driven by certain changes not only in general health status but also in the socio-economic status of elderly people (2,3).

In line with aging, the frequency of dealing with chronic diseases is also increasing (2-4). However, WHO (1998) argues that when discussing the overall health status of elderly people, disease prevalence or absence cannot or should not be recognized as the sole determinant. A vast majority of elderly people, although they have specific diseases, can still manage to feel totally healthy once the adverse effects of diseases that critically impact their daily lives are eliminated (4). Within this scope, quality of life (QoL) is defined as: "an individual's perception of his position in life in the context of the culture and value systems he lives in, and in relation to his goals, expectations, standards and concerns" (5-7).

It is feasible to list a number of variables of QoL; however, when the issue is old age it is assumed that socio-economic factors have a greater effect than individual factors on QoL. Because the income of the elderly is reduced, particularly after retirement, when health expenditure increases (largely due to deterioration of health), their likelihood of falling into poverty increases (2-3, 8-11). To be more specific, out-of-pocket health expenditures have a substantial effect on household budgets, limit the consumption of non-health goods and services, decrease available access to health services and push a number of families into the trap of medical poverty. Hence, compared to non-elderly people, poverty can be more persistent among elderly people, who can hardly escape from this trap. Studies indicate that the correlation between age and poverty is "U" shaped; in contrast to other groups, the elderly population is exposed to a greater incidence of poverty (2,9). In a broad sense, poverty is defined as the absence of production resources adequate to provide income and a sustainable budget (2, 10). In the world of elderly people, poverty displays itself in the form of hunger and malnutrition, unhealthiness, non-accessibility or limited access to education and other basic services, disease and resulting increase in death ratios, homelessness and unfavorable accommodation conditions, unsafe environmental conditions, isolation and alienation. Poverty also accounts for the emergence of nonparticipation in decision-making processes as well as economic, social and cultural life (8, 10,11).

Within the scope of WHO's "active and healthy aging" target, micro and macro level research is essential to determine health, social security and social service needs of elderly people, particularly those coping with poverty. Hence the purpose of this research was to assess the effects of poverty on the health and QoL of elderly people by conducting an empirical analysis of health status, health care utilization and QoL of people ages 65 and over living in Etimesgut district, Ankara.

Materials and Method

A cross-sectional survey design was used to determine the effects of poverty on health status, health care utilization and QoL of poor elderly people. The field study began in March 2014 and was completed in May 2014.

All social assistance beneficiaries, whose application was approved by Social Assistance and Solidarity Foundation, were considered as poor according to Turkish Law No 3294. In that sense, the study covered 116 people over the age of 65 who were determined to be a priority group for assistance by the Social Assistance and Solidarity Foundation in Etimesgut District, Ankara.

The questionnaire consisted of the following three sections: the first part included information on socio-demographic characteristics (age, gender, education, marital status, household characteristics, employment and income), the second part included questions related to health status and health care utilization (self health evaluation, chronic illness and disability, recent illness or injury, access to health care), and the final part consisted of the WHOQOL-OLD Scale. The WHOQOL-OLD scale consists of 24 Likert-type questions on 6 dimensions: "sensory abilities", "autonomy", "past, present and future activities", "social participation", "death and dying", and "intimacy". The "sensory abilities" dimension assesses sensory functioning and the impact of loss of sensory abilities on quality of life. The "autonomy" dimension refers to independence in old age and thus describes the

amount of being able to live autonomously and to take own decisions. While the "past, present, and future activities" dimension describes satisfaction about achievements in life and at things looking forward to, the "social participation" dimension delineates participation in activities of daily living, especially in the community. The "death and dying" dimension is related to concerns, worries, and fears about death and dying, while the "intimacy" dimension assesses being able to have personal and intimate relationships. Each dimension provides an individual score, and an overall score is also calculated from the set of 24 items. Total scores on the WHOQOL-OLD range from 24 to 120, with higher scores being indicative of better QoL. Validity and reliability of the WHOQOL-OLD scale for the Turkish population has been established by Eser et al. (12).

In the data analysis stage, the SPSS syntax file prepared by the WHOQOL-OLD Group was used to compute scores for each of the six dimensions and the total score of the WHOQOL-OLD scale. While the dependent variables of the study were variables related to health status, health care utilization and quality of life scores; socio-demographic characteristics were investigated as independent variables. The main independent variable was the average monthly income as a means to measure poverty. Elderly people whose income was below the average monthly income (168.9 Turkish liras) were considered as poorer. Chi Square Tests were performed to determine the relations between poverty and health status, health care utilization of elderly. The WHOQOL-OLD total score and scores for each of the dimensions were described by calculating mean and standard deviation (SD) values. Data normality was evaluated with the Kolmogorov-Smirnov Test. The Independent Samples T-Test, One-Way Analysis of Variance (ANOVA), Mann-Whitney U Test and Kruskal-Wallis Test were used to compare the scores of elderly people with respect to their poverty and socio-demographic characteristics.

This study was approved by the Baskent University Institutional Review Board and Ethics Committee (Project no: KA14/93) and supported by the Baskent University Research Fund.

Results

Table 1 shows the distribution of selected socio-demographic characteristics of the 116 elderly people who participated in this study. The average monthly income of participants was 168.94±54.67 Turkish Liras (TL). The main source of income was the old age pension (76.7%). All of the participants receiving the old age pension were living on less than 168.9 TL.

Table 1— Socio-demographic Characteristics of the Participants (n=116)

Characteristics	n	%
Age Group		
65-74	60	51.8
75-84	34	29.3
≥85	22	18.9
Sex		
Female	75	64.7
Male	41	35.3
Marital Status		
Married	49	42.2
Widow/widower	67	57.8
Living Arrangement		
Alone	13	11.2
With spouse	49	42.2
With children	54	46.6
Education		
Illiterate	80	68.9
Literate	36	31.1
Worked Previously for Wage		
Yes	33	28.4
No	83	71.6
Monthly Income (TL)		
<=168.9	96	82.8

Table 2 shows the distribution of participants' data on health status and health care utilization according to income level. In the context of health evaluation, elderly participants were asked to evaluate their health on a scale of 1 to 3 (1=good, 2=moderate, 3=poor). While 45% of elderly people whose income was above average rated their health as good; 38.5% of elderly people whose income was below average rated as poor. 79 participants of 116 total participants had at least one chronic disease/disability that had lasted more than 6 months. The most common chronic diseases were hypertension and diabetes mellitus. A total of 32 participants had experienced a sudden illness or injury such as flu, diarrhea, or fracture in the last 4 weeks. The most common sudden illness was cold/flu, comprising 90%, of all sudden illnesses. There were no significant correlations between participants' income level and variables related to health status ($p > 0.05$).

Table 2— Health Status and Health Care Utilization of Elderly People According to Income

	Below Average İncome (≤168.9 TL)		Above average income (>169 TL)		p
Characteristics	**n**	**%**	**n**	**%**	
Self Health Evaluation					
Good	29	30.2	9	45.0	0.377
Moderate	30	31.3	6	30.0	
Poor	37	38.5	5	25.0	
Chronic Disease and Disability					
Yes	62	64.6	17	85.0	0.060
No	34	35.4	3	15.0	
Recent Illness or Injury					
Yes	26	27.4	6	30.0	0.503
No	69	72.6	17	70.0	
Ever Delayed Seeking Help					
Yes	68	70.8	9	45.0	0.027*
No	28	29.2	11	55.0	
Ever Referred to The Hospital But Had Not Gone					
Yes	24	25.0	9	45.0	0.066
No	72	75.0	11	55.0	

*p<0.05

Regarding access to health care, the situation of elderly participants delaying/not seeking help was examined. Overall, 77 participants who delayed/did not seek help did so because they thought they could not afford to pay. Among the participants whose income was below average, more delayed/did not seeking help when they were ill (70.8% vs. 45.0%) (p<0.05). Thirty three participants had been referred to the hospital but had not gone. The most important reasons for not going to the hospital were transportation (81.8%) and economic problems (6.1%).

WHOQOL-OLD scale results for the 116 elderly participants are summarized in Table 3. The mean "death and dying" dimension score (88.79±19.02) was higher than scores on the other dimensions. Participants had the lowest mean score on the dimension of "social participation" (38.20±13.71). The mean score on the total WHOQOL-OLD scale was 50.44±8.25.

Table 4 shows the relationship between some characteristics of the elderly participants and their scores on the WHOQOL-OLD dimensions; several of these relationships were statistically significant (p<0.05). The "sensory abilities", "intimacy" and "total" scores of participants aged 65-74 were higher than scores for the other age groups. Furthermore, "death and dying" scores were higher for women than for

Table 3— Scores on WHOQOL-OLD Dimensions.

	Min	Max	Mean	SD
Sensory	6.25	81.25	42.83	14.68
Autonomy	18.75	81.25	43.42	13.88
Past, present and future activities	6.25	81.25	39.38	13.01
Social participation	.00	81.25	38.20	13.71
Death and dying	.00	100.00	88.79	19.02
Intimacy	12.50	93.75	50.05	19.09
Total Score	**27.08**	**70.83**	**50.44**	**8.25**

Table 4— Comparison of scores on WHOQOL-OLD Scale Dimensions According to Participants' Characteristics (Mean±SD)

	n	S	A	PPF	SP	DD	I	TS
Age Group								
65-74	60	45.83±14.17	43.96±11.90	42.08±13.16	40.73±12.94	88.02±20.27	54.27±17.05	52.41±6.98
75-84	34	40.81±15.71	42.46±17.26	36.03±13.77	35.48±16.19	92.83±10.22	43.57±21.62	48.09±9.93
≥85	22	37.78±13.01	43.47±13.70	37.22±9.92	35.51±10.46	84.66±24.83	48.58±17.98	47.92±6.97
p		0.048*	0.884	0.064	0.212	0.709	0.029*	0.021*
Gender								
Female	75	42.33±13.77	43.08±11.05	39.83±10.96	38.42±10.66	91.58±11.18	47.92±18.01	50.53±7.05
Male	41	43.75±16.36	44.05±18.11	38.57±16.23	37.80±18.17	83.69±27.70	53.96±20.58	50.30±10.20
p		0.390	0.720	0.618	0.635	0.032*	0.103	0.901
Education								
Illiterate	80	41.80±14.47	40.31±11.97	37.73±12.24	36.02±12.82	92.42±12.61	45.00±17.72	48.88±7.55
Literate	36	45.14±15.10	50.35±15.45	43.06±14.08	43.06±14.55	80.73±27.07	61.28±17.35	53.94±8.78
p		0.181	0.000*	0.041*	0.045*	0.023*	0.000*	0.002*
Worked Before for Wage								
Yes	33	44.70±16.10	48.30±16.70	41.48±14.73	40.34±17.05	83.90±27.56	55.87±19.07	52.43±9.29
No	83	42.09±14.11	41.49±12.17	38.55±12.26	37.35±12.15	90.74±14.06	47.74±18.71	49.66±7.73
p		0.254	0.017*	0.277	0.529	0.781	0.038*	0.103
Monthly Income (TL)								
≤168.9	96	42.97±14.35	42.45±12.76	38.48±11.84	36.52±11.73	91.02±13.87	48.96±19.51	50.07±758
>169	20	42.19±16.58	48.13±18.03	43.75±17.33	46.25±19.17	78.13±32.92	55.31±16.38	52.29±11.00
p		0.944	0.096	0.099	0.027*	0.005*	0.177	0.275
The Source of Income								
Old-age pension	89	42.63±13.93	41.78±12.66	37.64±11.23	36.66±11.96	90.66±14.20	48.88±19.30	49.71±7.17
Assistance from foundations	20	42.19±16.58	48.13±18.03	43.75±17.33	46.25±19.17	78.13±32.92	55.31±16.38	52.29±11.00
p		0.837	0.065	0.051	0.033*	0.009*	0.170	0.194

S: Sensory Abilities, A: Autonomy, PPF: Past, Present and Future Activities, SP: Social Participation, DD: Death and Dying, I: Intimacy, TS: Total Score
*p<0.05.

men. The "autonomy", "past, present and future activities", "social participation", "intimacy" and "total" scores of literate participants were higher than those of illiterates, and the "death and dying" scores of illiterates were higher than those of literate participants. Moreover, the "autonomy" and "intimacy" scores of participants who had previously worked for wages were higher than scores of those who had never worked. In addition, while the "social participation" scores of participants who had a monthly income over 169 TL were higher than scores for those who had a monthly income of 168.9 TL or lower, the "death and dying" scores of participants from the low income group were higher. Similarly, the "social participation" scores of participants who received an old-age pension were lower than the scores of those who received assistance from various foundations, while the "death and dying" scores were higher for the former group than for the latter group.

Discussion

In this study, health status, health care utilization and QoL data of 116 poor elderly people were examined to determine the effects of poverty on their health and QoL.

The average monthly income of the 116 participants in this study was 168.94 TL. This amount is below the absolute poverty line of 274.79 TL per capita in Turkey as of 2014. The monthly income of study participants receiving an old age pension was below 168.9 TL. In 2013, 797,426 elderly people out of a total of 5,891,694 elderly people received an old-age pension of 141.56 TL, according to Turkish Law No.2022 (1). When compared with OECD countries, this amount is far below average (2,10).

79 participants had at least one chronic disease/disability that had lasted more than 6 months. There was no significant

correlation between participants' income level and health status, yet it was reported that among the participants whose monthly income was below average, the number of people delaying/not seeking help was significantly higher (70% versus 45%). It has been highlighted in the literature that in addition to other factors, poverty, which has an effect on the emergence of chronic and acute diseases, also diminishes the utilization of health care services on account of poor social and economic conditions (3,8,9).

The total mean score on the WHOQOL-OLD Scale was 50.44±8.25 across all 116 participants. In the literature, no research has been reported on the correlation between poverty status and QoL for elderly people. However, the fact that the QoL score in the present study was far lower than comparable scores, not only in Turkey-based studies using the WHOQOL-OLD scale (5,12-14) but also in the majority of studies conducted in other countries (6,7,15-18), confirms the hypothesis that poverty has a negative effect on the QoL of elderly people.

On the WHOQOL-OLD scale, participants in this study obtained the lowest mean score on the dimension of "social participation" (38.20±13.71). However their "death and dying" dimension mean score (88.79±19.02) was higher than scores on the other dimensions. The low score on the "social participation" dimension suggests that elderly people rarely participate in social activities, and that the coexistence of poverty and old age accelerates social isolation and alienation. Women in particular, as well as those who are illiterate, those with income levels below average, those receiving an old age pension received higher scores on the dimension of "death and dying," which might be attributed to the fact that due to poverty, elderly people tend to be more fatalistic and accept the fact of death more easily. While the findings related to the WHOQOL-OLD scale dimension scores in this study are parallel to most of similar studies conducted in Turkey (5,13,14) but Eser at al. found that "death and dying" dimension mean score was lower than scores on the other dimensions (12).

When the total and dimension QoL scores were evaluated with respect to monthly income, it was found that those with an average monthly income over 169 TL had higher "social participation" scores while those with less than 168.9 TL per month had higher scores on the "death and dying" dimension. Parallel to this finding, a number of studies examining the QoL of elderly people and utilizing economic condition as a variable have found that those with higher income levels have higher QoL scores as well (6,14,16).

Compared to illiterates, literate participants received significantly higher "autonomy", "past, present and future activities", "social participation", "intimacy" and "total" scores and a significantly lower mean score for "death and dying". Similar studies on the QoL of the elderly populations of Turkey, Chile, Norway, Bangladesh, Vietnam, Mexico and Brazil have identified that a lower level of education is correlated to a decrease in QoL (5,6,14-18).

The findings of this research, considered together with findings from the relevant literature show that in order for people to experience a comfortable old age period in the community with no worries of poverty; health care services and social services should cooperate to develop policies focusing on increasing the QoL of elderly people. Improving old-age pensions given to elderly people within the scope of non-contributory payments by taking living standards into account should be evaluated as the first dimension of intervention, to mitigate and prevent poverty for the elderly. In this study, it has once again been underlined that education, even as low as a basic literacy level, was critically important for both income level and QoL. In the light of this finding, the second intervention dimension should be education, in order to mitigate the poverty of elderly people, increase the QoL of the elderly population and eliminate the adverse effects of poverty on QoL. Literacy programs should be provided for elderly people to assist them in obtaining their basic needs; such programs may also be considered as an opportunity to promote socialization. Another suggestion is to develop programs in which chronic diseases are followed up and whatever people require to manage these diseases is provided free of charge within the family medicine system. Free transportation should also be provided to ease access for elderly people coping with poverty. Developing and utilizing QoL scales specific to poverty may be beneficial in promoting holistic programs for the health of the elderly population.

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Zeliha Özlem YÜRÜK[1]
Aydan AYTAR[1]
Emine Handan TÜZÜN2
Levent EKER[3]
İnci YÜKSEL[4]
Natalie A. De MORTON[5]

RESEARCH

ACCEPTABILITY, RELIABILITY AND VALIDITY OF THE TURKISH VERSION OF THE DE MORTON MOBILITY INDEX IN ELDERLY PATIENTS WITH KNEE OSTEOARTHRITIS

ABSTRACT

Introduction: The de Morton Mobility Index is a newly developed instrument that assesses the mobility in elderly. The aim of the study was to translate the de Morton Mobility Index into Turkish and investigate its psychometric properties in elderly patients with knee osteoarthritis.

Materials and Method: The Turkish version of the de Morton Mobility Index was developed using the forward-backward translation method. Patients (n=100) were assessed using the Turkish version of the index, Western Ontario and McMaster Universities Osteoarthritis Index, and Timed Up and Go test. Acceptability was assessed in terms of refusal rate, and administration time. Floor and ceiling effects and skew of the distribution were measured. Intra-class correlation coefficients, standard error of measurement, and minimal detectable change scores were calculated. The Pearson's correlation coefficients were measured.

Results: Average time to complete the index was 7.8 minutes. The response rate was 99%. The reliability analyses were conducted with 40 patients. The intra-class correlation coefficient(2,1), standard error of measurement, minimal detectable change90, and minimal detectable change95 were 0.95, 3.15, 7.33, and 8.71, respectively. The de Morton Mobility Index scores were normally distributed, and had no floor or ceiling effects. Ninety-nine knee osteoarthritis patients were analyzed for validity. Correlation coefficients between the de Morton Mobility Index, Timed Up and Go test and the Western Ontario and McMaster Universities Osteoarthritis Index physical function, pain and stiffness subscales were -0.69, -0.70, -0.39, and -0.32, respectively.

Conclusion: The Turkish version of the de Morton Mobility Index is an acceptable, reliable and valid measure for assessing mobility in elderly patients with knee osteoarthritis.

Key Words: Osteoarthritis, Knee; Geriatric Assessment; Mobility Limitation; Outcome Assessment (Health Care).

ARAŞTIRMA

DİZ OSTEOARTRİTİ OLAN YAŞLI HASTALARDA DE MORTON MOBİLİTE İNDEKSİ'NİN TÜRKÇE VERSİYONUNUN KABUL EDİLEBİLİRLİK, GEÇERLİK VE GÜVENİRLİĞİ

ÖZ

Giriş: De Morton Mobilite İndeksi yaşlılarda fonksiyonel mobiliteyi değerlendirmek için yeni geliştirilmiş bir ölçektir. Bu çalışmanın amacı, De Morton Mobilite İndeksi'ni Türkçe'ye çevirmek ve diz osteoartriti olan yaşlı hastalarda psikometrik özelliklerini araştırmaktı.

Gereç ve Yöntem: De Morton Mobilite İndeksi'nin Türkçe versiyonu çeviri-geri çeviri yöntemi ile geliştirildi. Hastalar (n=100) indeksin yeni oluşturulan Türkçe versiyonu, "The Western Ontario and McMaster Universities Osteoarthritis Index" ve "Timed Up and Go Test" kullanılarak değerlendirildi. Kabul edilebilirlik, değerlendirmeyi kabul etmeme sıklığı ve uygulama süresi ile değerlendirildi. Taban ve tavan etkisi ve dağılımların çarpıklığı ölçüldü. Ölçümlerde sınıf içi korelasyon katsayısı, standart hata ve minimum saptanabilir değişim skorları hesaplandı. Pearson korelasyon katsayısı ölçüldü.

Bulgular: İndeksin ortalama tamamlanma süresi 7.8 dakika, cevaplanma oranı ise 99% idi. Güvenilirlik analizi 40 hastada yapıldı. Sınıf içi korelasyon katsayısı (2,1), standart hata, minimum saptanabilir değişim90 ve minimum saptanabilir değişim95 değerleri sırası ile 0.95, 3.15, 7.33 ve 8.71 bulundu. De Morton Mobilite İndeksi skorlarının normal olarak dağılım gösterdiği ve taban veya tavan etkisi olmadığı görüldü. Geçerlik analizi 99 diz osteoartritli hastada değerlendirildi. De Morton Mobilite İndeksi, "Timed Up and Go Test" ve "The Western Ontario and McMaster Universities Osteoarthritis Index"in fiziksel fonksiyon, ağrı ve tutukluk alt ölçekleri arasındaki korelasyon katsayıları sırası ile -0.69, -0.70, -0.39 ve -0.32 bulundu.

Sonuç: Diz osteoartriti olan yaşlı hastalarda De Morton Mobilite İndeksi'nin Türkçe versiyonu kabul edilebilir, güvenilir ve geçerli bir mobilite değerlendirme ölçümüdür.

Anahtar Sözcükler: Diz Osteoartriti; Geriatrik Değerlendirme; Hareket Kısıtlılığı; Ölçekler (Sağlık Bilimleri).

İletişim *(Correspondance)*

Zeliha Özlem YÜRÜK
Baskent University, Physiotherapy and Rehabilitation , ANKARA

Tlf: 03122466666
e-posta: bastug@baskent.edu.tr

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[1] Baskent University, Physiotherapy and Rehabilitation ANKARA
[2] Kırıkkale University, Physiotherapy and Rehabilitation KIRIKKALE
[3] Ministry of Health, General Directorate of Health Research ANKARA
[4] Hacettepe University, Physiotherapy and Rehabilitation ANKARA
[5] Donvale Rehabilitation Hospital, Ramsay Health, Department of Physiotherapy, Melbourne AVUSTRALYA

Introduction

Osteoarthritis (OA) is the most common form of arthritis, affecting approximately 15% of the population. Due to its predilection for lower extremity joints such as the knee and hip, OA is the leading cause of lower extremity disability among older adults (1). Felson et al. shows that the prevalence of knee OA increases with age throughout the elderly years (2). Although Turkey has a relatively younger population compared to European countries, life expectancy at birth has increased in recent years and elderly health has become a major challenge for this country as well. There is very little epidemiologic data for OA among the Turkish population. Prevalence studies have demonstrated that knee OA was estimated to be 5.35-14.8% in two different regions of Turkey (3).

Patients with knee OA suffer from a progressive loss of physical function, with increasing dependency in walking, climbing stairs, and other lower extremity tasks (4). Knee OA is sometimes referred to as the 'wear and tear' condition that clinically leads to declines in strength, joint stiffness and an increase in pain and mobility limitations (5). There is close association between mobility limitation and disability. Mobility limitations can often restrict activity and social participation, bring about isolation, anxiety and depression, and contribute to an overall poorer quality of life (6). Studies have shown that mobility limitations are a strong predictor of subsequent disabilities and the need for assistance (7). In the light of these findings, mobility limitations in patients with knee OA should be monitored closely and treated accordingly.

Several instruments such as Elderly Mobility Scale (8) and Rivermead Mobility Index (9) are used to assess mobility in elderly patients. The de Morton Mobility Index (DEMMI) is a newly developed instrument with a broad scale width that can measure mobility in many health care settings (10). It is administered by observation of mobility performance of the patient. Thus, this approach gives clinicians the opportunity to deal with the assessment limitations associated with cognitive deficits and recall bias.

Currently the DEMMI has been translated into Dutch, German, Mandarin, Thai and Danish but a Turkish translation of the DEMMI has not been previously conducted (11). The DEMMI has been validated with patients in acute (12), sub-acute (13), grade 4 OA who are candidate for replacement (14), those with Parkinson disease (15) and older adults living in the community (16). In this study, we aimed to translate the DEMMI into Turkish and to evaluate the acceptability, reliability, and validity of the Turkish version of the DEMMI in elderly patients with knee OA grades 2-3.

Materials and Method

Cross-Cultural Adaptation Process

The Turkish version of the DEMMI was developed with the forward-backward translation method (17). In the forward translation process, two independent qualified translators whose mother tongue was Turkish, translated the DEMMI to Turkish. In the backward translation processes, each of the first translations was back-translated independently from the other by two bilingual people, whose mother tongue was English. The back translators were not aware of the intent and concepts underlying the index. A multidisciplinary review committee composed of physicians, physiotherapists, and Turkish teachers compared the source and final versions of the index, and verified the cross-cultural equivalence of the source and final versions. Pre-final version of the index was applied to 10 knee OA patients as a pilot test. In this process we evaluated whether the translated index was understandable and the expressions were relevant with the Turkish culture.

Sample Size Justification

The sample size was determined based on statistical power analysis procedures using PASS 2005 software (NCSS, Kaysville, UT, USA). For the reliability, a sample size of 40 patients with two observations per patient achieves 81% power to detect an intraclass correlation of 0.80 under the alternative hypothesis when the intraclass correlation under the null hypothesis is 0.60, using a F-test with a significance level of 0.05. For the validity, the estimated sample size was calculated to be at least 84 patients under the null hypothesis (R0)=0, the value of correlation under the alternative hypothesis (R1)=0.30, Ha: R0 <> R1, ·=5% and ,=20%. Sample size was increased 20% to allow for drop outs, and set at 100 participants.

Participants

A total of 100 patients from University's Department of Physical Medicine and Rehabilitation outpatient clinic were enrolled in this study between April to December 2013. The ethics committee of the University approved the study (KA13/71). Each patient was informed about the study and gave written informed consent to participate. All patients fulfilled clinical and radiological criteria of the American College of Rheumatology for primary knee OA (18). Those

who were 65 and over, and who have been diagnosed as having grade 2-3 OA were included in the study. Patients with a history or active presence of other rheumatic diseases potentially responsible for a secondary OA, those with traumatic knee lesions, or those who scored 23 or less on the Mini-Mental Status Examination (MMSE) test were excluded from the study (19).

Instruments

De Morton Mobility Index (DEMMI)

The DEMMI is a performance based index to assess the mobility of older hospitalized patients. It measures transfers, static and dynamic balance, and walking. Interval level total scores range from "0" to "100" are obtained, where "0" represents poor mobility and "100" indicates independent mobility (13).

The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC Index)

The WOMAC Index is a disease specific, self-administered questionnaire developed to study patients with hip or knee OA. It consists of 24 questions, grouped into 3 subscales (pain, stiffness and physical function). In WOMAC index there are five alternative answers to every question (0=none, 1=mild, 2=moderate, 3=severe, 4= extreme). The maximum scores are 20 points for pain, 8 points for stiffness and 68 points for physical function. Higher scores indicate more or worse symptoms, maximal limitations and poor health. The Turkish version of WOMAC index was found valid, reliable and responsive in Turkish patients with knee OA (20).

Timed Up and Go test (TUG)

The TUG is a simple, quick and widely use clinical performance based on the measure of lower extremity function, mobility and fall risk. The TUG uses the time that a person takes to rise from a standard 45 cm chair, walk 3 m, turn around, walk back to the chair, and sit down. Using the standardized protocol, patients were asked to use their appropriate gait aid. The TUG results correlate with gait speed, balance, functional level, and the ability to go out; it can also follow change over time (21).

Procedure

All patients filled out a socio-demographic questionnaire. Two senior physiotherapists who have 10 years of experience in this clinical area administered all measurements. For validity analysis the DEMMI, WOMAC and TUG were applied one time by the first physiotherapist (Z.O.Y). Another physiotherapist (A.A) recorded the administration time for DEMMI per patient. After the first assessment and a one day interval, the DEMMI was repeated for 40 patients by the other physiotherapist (A.A) for reliability.

Statistical Analysis

In this study, we used the Statistical Package for the Social Sciences (IBM SPSS Statistics 20) for statistical analyses. Data were tested for normal distribution using the Shapiro-Wilk test. Acceptability of the DEMMI was assessed in terms of refusal rate, and administration time.

Reliability was evaluated using intra-class correlation coefficients (ICC) with a 2-way random-effects model and a 95% confidence interval (CI) for the ICC(2,1), and Bland and Altman method for assessing agreement (22). The mean difference between the two assessments with 95% limits of agreement as the mean difference (1.96 SD), and the percentage of differences that lie between $\pm 1.96\ SD_{diff}$ were calculated. ICC values were interpreted as: excellent reliability ≥0.80, moderate reliability =0.60-0.79, and questionable reliability <0.60 (13). We also calculated the standard error of measurement (SEM), and the minimal detectable change (MDC) scores.

Content validity was assessed at baseline by examining the floor and ceiling effects, and skew of the distribution in the index. We hypothesized that the skewness statistics range would range from - 1 to +1, and floor and ceiling effects would be less than 15%. Convergent and divergent construct validity were assessed at baseline by examining the correlation coefficients of the DEMMI score compared to the subscale scores of the WOMAC, and to the results of the TUG test. The correlation coefficients were interpreted as follows: ≤0.35, low or weak correlations; 0.36–0.67, modest or moderate correlations; 0.68–0.89, strong or high correlations; and ≥0.90, very high correlations (23).

RESULTS

A total of 100 patients with knee OA participated in the study however one patient did not complete the validity test. The majority of the patients were female (Table 1).

Translation

After the pilot testing, no changes were made in the items and instructions of the Turkish DEMMI.

Data Quality and Acceptability

Average time to complete the DEMMI was 7.8 min (SD=2.1). The Shapiro-Wilk tests showed that the DEMMI scores were normally distributed (p=0.117).

Table 1— Socio-Demographic Characteristics of the Patients.

Characteristics	n (%)
Sex	
Female	90 (90.0)
Male	10 (10.0)
Age, Mean (SD), Years	71.5 (6.1)
Education Status	
Primary Level	66 (66.0)
Secondary Level	4 (4.0)
High School Level	16 (16.0)
University	14 (14.0)
Employment Status	
Unemployed	1 (1.0)
Retired	29 (29.0)
Housewife	70 (70.0)
BMI	
Underweight	– (–)
Normal range	6 (6.0)
Overweight	21 (21.0)
Obese class I	40 (40.0)
Obese class II	32 (32.0)
Obese class III	1 (1.0)

BMI: Body Mass Index.

Reliability

The ICC (2,1) value for the inter-rater reliability was 0.95 (95% CI; 0.90-0.97). Mean scores of the first and the second round of the DEMMI were 71.53±15.6 and 71.03±9.03, respectively. The mean of the differences between two assessments was 0.50 (SD=6.03) (95%CI; -1.43-2.43). The percentage of differences laying between ±1.96 SD_{diff} was 95.0. The SEM was calculated to be 3.15 based on $SD_{baseline}$=14.1, and ICC= 0.95. Based on SEM=3.15, and z_{90}=1.65, and z_{95}=1.96, the MDC_{90} and MDC_{95} scores were calculated to be 7.33 and 8.71, respectively.

Validity

The skewness statistic was - 0.17. Five per cent of the patients had the highest score possible on the DEMMI. A floor effect was not present. Table 2 shows Pearson's correlation coefficients between DEMMI and WOMAC subscales, and TUG scores. The mean score on the DEMMI was 68.93 ± 14.3. The DEMMI score showed statistically significant and strong correlations with both the WOMAC physical function subscale and TUG scores. Although the correlation coefficients were significant at 0.01 levels, the DEMMI score was weakly correlated with the scores on the WOMAC pain and stiffness subscales.

Table 2— Correlation Coefficients Between DEMMI and WOMAC Subscales, and TUG Scores.

Measure		Correlation Coefficient (r)
WOMAC	Pain Subscale	-0.39*
	Stiffness Subscale	-0.32*
	Physical Function Subscale	-0.70*
TUG		-0.69*

DEMMI: de Morton Mobility Index, WOMAC: Western Ontario and McMaster Universities Osteoarthritis Index, TUG: Timed Up and Go Test, *Correlation is significant at the 0.01 level (2-tailed).

Discussion

The current study investigated the acceptability, reliability, and validity of the Turkish version of the DEMMI. The instrument was considered acceptable by the patients with knee OA. The DEMMI scores were stable and consistent over repeated administrations. The DEMMI was significantly related to other measures of mobility and physical function.

Clinical scales must possess adequate reliability and validity to be meaningfully employed for research or clinical activities. A clinically useful scale should also be acceptable to patients and health care professionals, and practical to administer. Both in research and individual practices, it is essential to use highly reliable scales so as to reduce the chance of faulty decisions (24). Our ICC scores estimated 95% of the observed score variance was due to true score variance. This result is similar with that found in the study by Jans et al.(14) (ICC=0.85) , and shows that the Turkish version of the DEMMI is a reliable index to measure the mobility of elderly patients with knee OA. In our study, standard error of measurement was found to be 3.15, indicating that the scores did not deviate too greatly from their true value. This result is consistent with that found in a previous study (25). The small value of the SEM for the Turkish version of DEMMI indicates that measurements made by two different physiotherapists were stable and reproducible thereby implying precision in measurements. Our result revealed that the mean of the differences between two physiotherapists were narrow. This finding indicates that the assessments of the two physiotherapists were essentially equivalent. The analysis shows that the

MDC_{90} was 7.33. This means that when the change in the scores of an individual knee OA patient between two measurements reaches 7.33 points over the 100 point DEMMI scale, the clinicians may interpret the change as true and reliable, given the 90% CI.

The small percentage of patients who scored the highest and lowest possible scores on the DEMMI indicates that the scale width of the Turkish version of the DEMMI provided validity in detecting mobility changes in individuals or groups over time. The normal distribution of the Turkish version of the DEMMI scores shows its ability to adequately capture information about an individuals' mobility. Based on these findings we can report that the Turkish version of the DEMMI has a good content validity.

At the beginning of the study we hypothesized that DEMMI scores are highly correlated with the WOMAC physical function subscale score, and the TUG test (convergent validity). Our results showed significant and strong correlations among these measures supported the convergent validity of the Turkish version of the DEMMI. Similar to our results, Johnston et al.(15) found moderate to high correlations (Spear-man's rho -0.57; -0.42 to -0.69) between DEMMI and other mobility-related outcomes that also included the TUG. Their results demonstrated evidence of convergent validity.

We further hypothesized that DEMMI score would be inadequately or weakly correlated with the WOMAC pain and stiffness subscales scores (divergent validity). The weak correlations between DEMMI and WOMAC pain and stiffness subscales were found and this was the evidence of divergent validity. Jans et al. found that there was strong correlation between the DEMMI and the TUG (-0.73); and weak correlations between the DEMMI and all subscales of the WOMAC (physical function: 0.44; pain: 0.32; stiffness; 0.33). Our results were similar to those of Jans et al. except for the WOMAC physical function score (14).

Psychometric validation is the process by which an instrument is assessed for reliability and validity by mounting a series of defined tests on the population group for whom the instrument is intended. However, clinical measurement tools should have additional attributes such as responsiveness. In the current study this was the limitation and these properties were not evaluated but may need to be considered in future studies.

In conclusion, this study provides evidence that the Turkish version of the DEMMI is an acceptable, reliable and valid measure of mobility in elderly patients with knee OA. The Turkish version of the DEMMI now needs to be evaluated with different patient populations, and the responsiveness of the Turkish DEMMI may need to be evaluated in future studies.

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Fatma BAŞALAN İZ[1]
Emrah ATAY[2]

RESEARCH

HOW EFFECTIVE ARE EXERCISE RECOMMENDATIONS SUPPORTED BY WRITTEN AND VISUAL MATERIALS IN ELDERLY PEOPLE?

ABSTRACT

Introduction: This study examines the effects of exercise recommendations supported by written and visual materials on physical parameters, balance, fear of falling and quality of life.

Materials and Methods: This quasi-experimental study was carried out in Isparta, Turkey. The sample consisted of 32 elders. The research data were collected during home visits. The data collection tools included the Fullerton Balance Scale, Tinetti Falls Efficacy Scale, World Health Organization Quality of Life-Short Form, Turkish Version, and handgrip-back-leg strength measurements.

Results: The mean score for Tinetti Falls Efficacy Scale was lower in overweight individuals based on Body Mass Index. The mean score for Fullerton Balance Scale was significantly lower in the elderly who have fear of falling. The initial exercise rate of 31.3% increased to 43.8% at the end of the study.

Conclusion: In general, the verbal instructions alone were found to be ineffective. However, this study has demonstrated that when healthcare professionals support their verbal exercise recommendations with written and visual materials, they can make a positive contribution.

Key Words: Exercise; Fall; Aged; Accidental Falls; Postural Balance; Fear; Outcome Assessment (Health Care).

ARAŞTIRMA

YAZILI VE GÖRSEL MATERYALLERLE DESTEKLENEN EGZERSİZ ÖNERİLERİ YAŞLI BİREYLERDE NE KADAR ETKİLİ?

ÖZ

Giriş: Bu çalışma, yazılı ve görsel materyaller ile desteklenen egzersiz önerilerinin fiziksel parametreler, denge, düşme korkusu ve yaşam kalitesi üzerine etkisini araştırır.

Gereç ve Yöntem: Yarı deneysel çalışma Isparta'da yapıldı. Örneklem 32 yaşlıdan oluştu. Veriler ev ziyaretinde toplandı. Çalışmada Fullerton Denge Düzeyi Ölçeği, Tinetti Düşmenin Etkisi Ölçeği, Dünya Sağlık Örgütü Yaşam Kalitesi Ölçeği-Kısa Form kullanıldı. El-sırt-bacak kuvveti ölçümleri yapıldı.

Bulgular: Body Mass Index'e göre şişman yaşlıların Tinetti Düşmenin Etkisi Ölçeği puanı daha düşük hesaplandı. Fullerton Denge Düzeyi Ölçeği puan ortalaması düşmekten korkan yaşlılarda daha düşük bulundu. Çalışmanın başında %31.3 olan egzersiz yapma oranı çalışmanın sonunda % 43.8 oldu.

Sonuç: Genel olarak sözel talimatlar etkili bulunmadı. Fakat çalışmanın sonuçları sağlık çalışanları tarafından sözel egzersiz tavsiyelerinin yazılı ve görsel materyaller ile desteklendiğinde olumlu katkı yapabileceğini gösterdi.

Anahtar Sözcüker: Egzersiz; Düşme; Yaşlı; Kazaya Bağlı Düşmeler; Denge; Korku; Değerlendirme (Sağlık Hizmeti).

İletişim *(Correspondance)*

Fatma BAŞALAN İZ
Süleyman Demirel Üniversitesi Hemşirelik Fakültesi
ISPARTA

Tlf: 0246 211 33 15
e-posta: fbasalan@gmail.com

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[1] Süleyman Demirel Üniversitesi Hemşirelik Fakültesi ISPARTA
[2] Mehmet Akif Üniversitesi Spor Hekimliği BURDUR

INTRODUCTION

There are many positive effects of physical activity on elders' health (1). Regular physical activity from a young age decreases the risk of cardiovascular ill-health, hypertension, type II diabetes, osteoporosis, obesity, colon cancer, breast cancer, and depression. Physical activity reduces falls and fall-related injury risks, especially in elderly people, and prevents loss of or restores functional features. Physical activity is also an effective therapy for many chronic diseases (2).

Health promotion and fighting a sedentary life style are a fundamental part of a national disease prevention policy. Doctors and other health care providers have the potential to change the unhealthy lifestyle of patients. The World Health Organization and other organizations have suggested that health professionals promote physical activity (3). For example, the American College of Sport Medicine advocates physical activity as an effective treatment for the prevention of disease, and exercise prescriptions are standard (4). Workouts improving muscle strength should be performed at least twice a week. Aerobic exercises for 150 minutes at medium intensity or 75 minutes at severe intensity are recommended to protect health (1).

Interventions to increase physical activity should be a priority for public health, and these interventions should be made at primary care institutions (5). It is known that interventions to increase physical activity applied by primary care institutions improve physical activity levels (6). Innovative strategies are required to encourage people to engage in regular physical activity (7). Exercise suggestions supported by written materials provide better comprehension of suggestions by increasing interaction between doctors and patients. Furthermore, written suggestions improve an individual's exercise motivation (8). However, because many doctors lack time for prevention programs, other health staff can be employed to increase participation in physical activity. Nurses and other health staff can evaluate physical activity, write exercise prescriptions and follow patients' exercises (9).

In this study, we evaluated the results of exercise suggestions supported by written and visual materials and measured by physical parameters, balance level, fear of falling and quality of life.

MATERIALS AND METHOD

Design and Procedure

This quasi-experimental study was carried out between 1 March and 20 May, 2012, in Isparta, Turkey.

Population and Sample

Elderly individuals aged 65-70 that were currently registered at the Family Health Centers (FHC) formed the population of the study. The FHCs are places where primary care is delivered as well as a range of other services: prevention and treatment services, registration of births, pregnancy, guardianship and elderly caregivers are registered at FHCs. FHCs are designed to be easily accessible. There are about 2500-3500 individuals registered with each FHC. There are 52 FHCs in the area where the research was conducted, and the participants in the study were from five of these, selected on the basis of income status and education level. The study population consisted of the patients currently registered at these FHCs. Older adults who were generally fit and had no health conditions that would limit their mobility were identified by their doctors. A total of 250 older adults meeting the criteria were asked whether they would be willing to participate in the study. Of the 80 volunteers with no medical conditions to restrict exercise ability, 48 dropped out of the study after the first follow-up. As a result, the study included a sample of 32 elder adults with no mobility restrictions, who were willing to participate.

Data Collection Technique and Data Collection Materials

Data were collected through home visits. Data collection for each individual took place over two months. In the first step of data collection the participants viewed a short film, "Physical Activity for Older Adults," which had been prepared by one of the researchers. This film explained the benefits of exercise, recommended exercises for elderly people, and was accompanied by an illustrated booklet with suggestions for exercise three days a week. The exercise booklet and movie included exercise instructions addressing biomotoric features such as endurance, strength, flexibility and balance. These four biomotoric features contained exercises designed to enhance the functional capacity of the elderly, the ability to engage in activities needed for daily living such as climbing stairs, carrying bags, walking long distances, bending, reaching, dressing, and bathing. The booklet contained step-by-step written instructions with photos to demonstrate how to correctly perform each exercise. While strength and flexibility exercises included activities addressing upper and lower extremities, balance exercises contained lower extremity exercises, and endurance exercises consisted of fast-paced walks (brisk walking). In addition, the booklet also featured warm-up and cool-down exercises for the elderly.



The relevant forms were filled in and measurements taken during this first interview. At the end of the first month, the participants were asked by telephone whether they were following the exercise suggestions and at the end of the second month the measurements were performed again. A number of different tools were used for data collection: the Fullerton Balance Scale (FBS), the Tinetti Falls Efficacy Scale (TFES) and the WHOQOL-BREF-TR Quality of Life Scale (World Health Organization Quality of Life-Short Form, Turkish Version). In addition, a form was completed that had been produced by researchers showing socio-demographic variations, body mass index, falling status in the past year, location of any fall, concern about falling, tools used for walking, exercise taken, pulse rate, blood pressure, lower-upper extremity strength and flexibility features. Muscle strength measurements were also taken using a hand dynamometer and dorsal-leg dynamometer.

Fullerton Balance Scale (FBS): This is a test which determines the functional status of an individual's balance. The test has 10 parameters: standing with eyes shut, reaching for an object, turning 360 degrees, going up and down stairs, tandem walking, standing on one leg, standing on a foam surface with eyes shut, jumping on two legs, walking with head rotation and how balance is corrected when off balance. The rating for this scale is between 0 and 4 (10).

Tinetti Falls Efficacy Scale (TFES): This scale was developed by Tinetti et al. to measure fear of falling (11). The scale consists of ten items. Points from 0 to 10 are given for each item and when points are added up a score from 0 to 100 is obtained (12).

World Health Organization Quality of Life-Short Form, Turkish Version/WHOQOL-REF- TR Quality of Life Scale: The WHOQOL-BREF Quality of Life Scale was developed by the World Health Organization, and a reliability and validity study for Turkey was carried out by Eser et al. (1999). The scale goes from one to five. Field scores are calculated from 4-20 points and 0-100 points, separately (13).

Lower-Upper Extremity Strength and Flexibility Tests: Lower extremity flexibility (chair sit and reach test): This test measures flexibility of the legs. The test was performed twice. The tip of the shoe was taken as point zero, and the values were recorded. The better of the two measurements was used for analysis. Upper extremity flexibility (back scratch test): This test measures movement range of the upper extremities. The exercise was demonstrated; two trials were completed and the test was performed twice. Measurements were made with a 2-cm tapeline. The better of the two measurements was recorded. Lower extremity strength (30 seconds chair sit-stand test): This test measures lower extremity strength. The elder was instructed to stand and sit. A standing count after 30 seconds was recorded (14). Dorsal strength: The elder stood on the dynamometer platform with back straight, head erect and knees tight. Three trials were completed and the best was recorded. Leg strength: The elder stood on the dynamometer. Three trials were completed and the best was recorded. Handgrip strength: The elder stood in a steering position with arms lateral and Jamar Dynamometer was held parallel to the body. The dynamometer was squeezed powerfully without moving the arm. Measurements were taken for both hands. Three attempts were made and the best was recorded (15).

Data Analysis

Data analysis was done using SPSS 15.0 for Windows. In order to determine whether the data corresponded the parametric test assumptions, we evaluated the conformity of the data to the standard normal distribution as well as homogeneity of variances. Descriptive statistics were calculated. The difference for each variable before and after exercise was compared using an Paired Sample t-Test, One Way ANOVA, and $p<0.05$ was considered statistically significant.

Ethical Consideration

Scientific research commission permission, institution permission and informed consent forms were obtained for the study.

RESULTS

Of the individuals participating in the study, 56.3% were female and 43.8% male; 81.3% were married; 62.5% were primary school graduates; 84.4% had spent most of their life in the same province; and 90.6% had a regular income. 43.8% required constant medication for a medical condition and 50.0% had hypertension. 21.9% who had had a fall experience in the past year, 43.8% were concerned about falling, and 9.4% used support such as a walking stick. At the start of the study, 31.3% reported that they did exercise and at the end of the study this rose to 43.8%.

This study investigated any possible statistical correlations between all independent variables and dependent variable, and only included data yielding statistically significant

Table 1— Examining FBS, TFES, Sub-dimension of WHOQOL BREF-TR Quality of Life Scale Score Means with Some Features Belonging to Elderly People

	n	%	Fullerton Balance Scale	Tinetti Falls Efficacy Scale	WHOQOL-Bref-TR Quality of Life Scale- Physical Field
Body Mass Index					
Normal	8	25.0	31.1±2.1	92.7±2.3	15.8±2.1
Overweight	14	43.8	29.6±2.1	85.7±3.3	14.2±2.4
Obese	10	31.3	23.1±3.6	77.4±3.9	12.8±2.1
			F=2.251	**F=3.820**	**F=3.985**
			p=0.123	**p=0.018**	**p=0.030**
Fear of Falling?					
Yes	14	43.8	23.6±2.4	81.8±4.1	13.7±2.9
No	18	56.3	31.3±1.8	87.2±2.4	14.5±2.0
			t=2.530	**t=1.192**	t=0.857
			p=0.017	**p=0.242**	p=0.398

relationships. The mean score for TFES in the overweight group, as determined by BMI, was significantly lower than the other group (p=0.01). Another statistical significance was found in the lower mean score for physical domain (p=0.03). The lower mean score for FBS found in the elderly with fear of falling was also statistically significant (p=0.01) (Table 1).

Comparing data obtained from the first interview when exercise advice was given with the data obtained at 2 months, a statistically significant difference was found in terms of pulse rate, FBS and WHOQOL-Bref-TR mental field (p<0.05), (Table 2).

Discussion

This study investigated the contribution of verbal suggestions supported by written and visual material provided by health staff on individuals' functional features, fear of falling and quality of life. Although a larger sample size was originally intended for this study, this was not possible due to several factors. One of the influential factors was the small number of elder adults without health conditions restricting physical activity. The other reason was the patients' reluctance to participate in the research. Besides, the individuals volunteering to participate in the study failed to keep up with the prescribed exercise program, and then dropped out of the study. The probable reasons to discontinue exercise or drop out were failure to incorporate exercise into the daily life, inability to gain the habit of exercising, and relatively long duration of study. Another limitation of this research might be that the participants were not under the supervision of the researchers while they followed the exercise program. However, this may provide important implications in understanding the degree of compliance with the exercise recommendations among the participants.

A decline of 2.8% in systolic blood pulse and 4.5% in diastolic blood pulse was found, but this decline was not statistically significant. A similar study found that an experimental group's systolic and diastolic blood pressure improved, but these improvements were not statistically significant (16). In their study, Robert et al. (2003) also established that declines occurred in participants' systolic and diastolic blood pressure, but these declines were not statistically significant (17). Atay et al. (2014) did not find statistically significant differences in diastolic blood pressure (3). Findings in the literature are similar to findings in this study.

A study of individuals with an average age of 84 found that resistance exercises applied twice week improved muscle strength (18). In another study, individuals were divided into four groups: a control group, a group working on strength, a group doing aerobic exercise and a group doing combined training. At the end of the 16-week applied training program, it was found that statistically significant differences occurred in isokinetic strength for groups working on strength and having aerobic exercise. The same study found that flexibility measures for groups working on strength, aerobic exercise and combined training exhibited benefits, com-

Table 2— Examining the Relationship of Some Physiological Measurements, Strength Tests, FBS, TFES, Sub-dimension of WHOQOL BREF-TR Quality of Life Scale Score

	First Measurement		Last Measurement
Pulse	80.2±7.0	**t=-2.149 p=0.040**	82.1±6.4
Systolic blood pressure	125.7±16.6	t=1.266 p=0.215	122.1±14.2
Diastolic blood pressure	81.6±11.9	t=1.469 p=0.152	77.8±8.2
Lower extremity flexibility (Chair sit and reach)	9.3±7.5	t=0.106 p=0.916	9.2±9.8
Upper extremity flexibility (Back scratch test)	15.1±12.5	t=-0.022 p=0.982	15.17±13.5
Lower extremity strength (Chair sit-stand test)	9.9±11.7	t=0.342 p=0.735	9.7±13.0
Dorsal strength test	36.6±31.0	t=-1.037 p=0.308	42.9±36.0
Lower extremity strength (Leg strength test)	41.5±30.3	t=-0.792 p=0.434	46.0±32.2
Handgrip strength (Non-dominant hand)	11.0±13.0	t=-0.778 p=0.444	12.7±11.3
Handgrip strength (Dominant hand)	21.8±10.3	t=1.329 p=0.193	19.5±8.6
Fullerton balance level	27.2±9.6	**t=-2.075 p=0.046**	27.9±9.2
Tinetti falls efficacy	85.7±13.3	t=0.622 p=0.538	84.9±12.8
WHOQOL-Bref-TR Physical Field	14.2±2.5	t=-0.656 p=0.516	14.3±2.1
WHOQOL-Bref-TR Mental Field	12.8±1.3	**t=-3.056 p=0.005**	13.3±1.4
WHOQOL-Bref-TR Social Relationship Field	14.2±3.0	t=-1.046 p=0.304	14.5±2.2
WHOQOL-Bref-TR Environment Field	14.9±3.2	t=-1.506 p=0.142	15.3±3.1

pared with the control group (19). No study was found in the literature examining the effect of strength and flexibility using exercise prescription, so the findings of this study will make an important contribution to the literature.

In this study, fear of falling increased by 2.4%. This increase was not statistically significant. A similar study found declines in participants' fear of falling and injury (16). In a study of females living in rural and urban environments, Wilcox et al. (2000) found that regional status provides different obstacles regarding participation in physical activity. Their study found that rural region females' fear of injury and the security of the exercise environment were higher than for urban females. Fear of injury is thought to be an important obstacle to participation in sport (20). A decline in fear of falling has been shown to be related to the length of the study. Fear of falling is expected to decrease the more the period of study increases. This expectation is related to increments in functional capacity. Our study lasted about two and a half months. Increases in fear of falling may have occurred because the individuals participating in the study did not have a suitable exercise environment. It is also thought that sudden increases in individuals' movement capacity may trigger falling fear.

Increases were found in physical and social relationships and environment sub-fields of the WHOQOL-Bref Quality of

Life Scale, but these increments were not statistically significant. In addition, a significant increase occurred in the mental sub-field. Other studies have found that exercise decreased participants' depression emotions and increased their wellness levels (21). It has been reported that education and suggestions given to patients by cardiac rehabilitation centers increased patients' quality of life (22). The literature suggests that exercise prescription generally leads to improvements. However, some findings challenge this view (23). Norris et al. (2000) observed that there was no change in the mental health of an experimental group after six months of physical activity (24). Results of a meta-analysis showed that exercise prescriptions that were written medically and observed had a positive effect on health (6). In a previous study suggestions were given to individuals, but whether these suggestions were followed or not was not ascertained. In the relevant literature, verbal instructions encouraging exercise have not been reported to be effective.

Interventions to increase physical activity and improve physical conditions have appeared in the literature. However, the effectiveness of the interventions is directly related to how these interventions are made. Interventions to increase physical activity using suggestions supported by written materials and exercise instructions are recommended. To better determine the effectiveness of interventions, they should be made with someone who acts as a guide. When these interventions are made with a guide, following the exercises is easier. Participation in exercise is more difficult when individuals practice alone. This study has established that verbal suggestions, supported by written and visual materials, make a positive contribution to the uptake of exercise.

Home visits are very important, because they improve communication between the individual and nurse. Home visits help to improve and protect health. Regular home visits are necessary for establishing health-promoting behaviors. Nurses have an important role in the acquisition of health promotion behavior. Nurses who are reliable and talented, and who have good communication skills, can increase people's physical activity levels. For this to happen effectively, courses related to physical activity should be part of the curriculum during initial training in nursing school.

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Erdem İlker MUTLU

Review Article

GERIATRICS AND NATURAL LAW: THE MISSING LINK

Abstract

Geriatric community is a vulnerable group under a high risk of losing social network, cognitive abilities and health status. Therefore, they have to be given easy access to healthcare services as a part of their socioeconomic rights. However, healthcare rights and other socioeconomic rights are not deemed strongly enforceable against public authorities in contemporary public opinion. Although many constitutions and international treaties provide socioeconomic rights for citizens, national legal systems resist not to recognize these rights and give them enforceability. This study offers the approach of natural law to be referred when the ethical side of socioeconomic rights of vulnerable groups are dismissed by lawmakers.

Key Words: Geriatrics; Health Services for the Aged/Legislation & Jurisprudence; Health Services for the Aged/Ethics.

Derleme

DOĞAL HUKUK VE GERİATRİ: GÖZDEN KAÇAN BAĞ

Öz

Yaşlı nüfus, kişisel sağlık durumlarını, sosyal ağlarını ve algı yeteneklerini kaybetme riski yüksek bir kırılgan sosyal gruptur. Bu nedenle, sosyoekonomik haklarının bir parçası olarak bu gruba sağlık hizmetlerine daha kolay erişim hakkı verilmelidir. Buna rağmen, çağdaş kamuoyunda, sağlık hizmetleri ve diğer sosyoekonomik hakların kamu otoriteleri önünde hukuksal zorlayıcılığı olmadığı kabul edilmektedir. Birçok anayasa ve uluslararası sözleşme, vatandaşlara sosyoekonomik haklar sağlarken ulusal hukuk sistemleri bunları tanımamak ve zorlayıcılık gücü vermemek konusunda direnmektedir. Bu çalışma,yaşlı nüfus gibi kırılgan grupların sosyoekonomik haklarının etik yanları yasa koyucular tarafından göz ardı edildiğinde mutlaka doğal hukuk yaklaşımının göz önüne alınmasını önermektedir. Böylece toplum sağlığı için tamamlayıcı bir hukuksal yaklaşım elde edilebilecektir.

Anahtar Sözcükler: Geriatri; Yaşlılar için Sağlık Servisleri/Mevzuat ve Uygulamalar; Yaşlılar için Sağlık Servisleri/Etik.

İletişim *(Correspondance)*

Erdem İlker MUTLU
Hacettepe Üniversitesi, Hukuk Fakültesi-Milletlerarası Hukuk Anabilim Dalı ANKARA

Tlf: 0312 297 62 76
e-posta: eimutlu@gmail.com

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Hacettepe Üniversitesi, Hukuk Fakültesi-Milletlerarası Hukuk Anabilim Dalı ANKARA

INTRODUCTION

This article aims to offer a theoretical analysis of natural law in the context of geriatric healthcare, which affects the lives of 8 to 10% of the global population over the age of 65 (1, 2). A vigilant consideration of the healthcare needs of this vulnerable group is vital for the social state, which derives its power from the natural law of citizens under social contract (3). However, socioeconomic disparities and a lack of strong legal protection lead to health disparities (4).

Among other vulnerable groups, older adults are at higher risk of health disparities as a result of their health status, cognitive ability and social network. They often experience decreasing information processing and problem solving abilities due to declining memory capacity, and are less socially integrated because of physical problems with mobility (5). Therefore, older adults need more intensive care and easier access to health services than any other vulnerable group.

Another point of vulnerability arises from unintentional paternalism influencing the provision of services for this group. In order to avoid paternalism, ethical principles such as beneficence, non-maleficence, justice, autonomy and acts of government are applied (6). However, answers to the question "How should society provide healthcare services to older adults?" must consider not only the vulnerability of this group, but also the spirit of public services (7).

This analysis considers healthcare for older adults exclusively from a legal perspective. It first defines two prominent concepts, social and economic rights [hereinafter socioeconomic rights] and natural law. Next, it presents an argument against a common prejudice against the basic idea of social rights and their so-called "non-enforceability." In order to eliminate this prejudice, the concept of social values and the application of these values to social life by virtue of natural law will be discussed with reference to one of the most significant legal theories on rights, by Dworkin (8). This consideration of legal theory is followed by an ethical proposition for what natural law can offer when positive law does not sufficiently address the needs of vulnerable groups who share the moral values that public services represent (9).

DEFINITIONS

Natural Law: Natural Law is generally defined as a system of law, composed of rules and principles that are determined by nature and are supreme to state power. Even in the *Ancien Régime*, individuals were conferred a limited set of rights (10, 11). Similarly, industrialisation in the 18th century facilitated urbanisation and a new form of institutionalisation, in which societies developed shared ethical and moral values (10, 12).

Socio-Economic Rights: Contemporary public law encompasses the following social and economic rights:

- Labour rights,
- Right to fair payment for workers,
- Rights related to trade unions,
- Right to organise and workers' right to strike,
- Collective bargaining,
- Social security rights,
- Right to a fair living standard,
- Right to a health standard,
- Right to education,

Rights provided to protect family, women, children, younger adults, older adults, and immigrants; right to be protected against poverty and social exclusion; and right to accommodation (13).

Socio-economic rights are also granted to citizens through international treaties. Common to these treaties is relaxed definitions of civil and political rights. The vagueness of these definitions is directly related to vague protection standards (14).

THE ARGUMENT

Does Natural Law Provide Social Rights to Citizens/Vulnerable Groups?

During the decade following World War II, higher values of humanity have been incorporated into positive law. Instruments used by positive law are fundamental rights catalogues, constitutions or multinational charters. Schlink, an expert in German Constitutional Law, intensely underlines the fact that the corrupt justice system of the *Third Reich* arose from the dismissal of natural law and ethics (15). However, at the end of the war, the "divine" and "non-destroyable dictatorship" of "positivist law" collapsed. The disciplines of Philosophy of Law and History of Law defined the next era in world history as a "Renaissance of Natural Law," where the fundamental rights and liberties of human beings are re-considered under a new legal order on both national and international planes, within the context of international treaties such as the Universal Declaration of Human Rights, European Convention on Human Rights, UN Covenant on Civil and Political Rights, European Court of Human Rights, Inter-

American Court of Human Rights, European Social Charter, etc.

The types of rules assessed within the context of the above mentioned documents have supremacy in case of conflict with rules of positive law provided under national legal systems. Generally, in order to grant the natural law a sphere in hard law, some of these values are given space within the context of provisions of positive law. However, in some cases, citizens allege the presence of non-codified rights, which are not recognised by public authorities (14). What should public authorities do when non-codified forms of rights are invoked by citizens? (8)

The rights and freedoms granted to citizens under constitutions and international documents become the responsibility of public authorities, against individuals who are the subjects of those rights-freedoms. It is also possible to give reference to state responsibility in international law, where protection of fundamental rights and freedoms becomes an international duty under a treaty signed by a state party (16). Others are national duties which generally arise from a social contract such as a constitutional right-freedom. *Differentia specifica,* (According to Aristotle, it is the attribute by which one differs from all others of the same genus. http://pennance.us/home/downloads/definition.pdf) between two, is the partial autonomy that occurs during monitoring of the implementation of international responsibilities. Governments have to take part in international treaties through constitutional regulations. At this stage, the case is not only a question of international responsibilities, but also a question of national constitutional task (17).

Legal enforcement of fundamental rights before constitutional adjudication has been the first step to create strong constitutional rights in the realm of social healthcare. US constitutional lawyers claim a "*state action doctrine*" where constitutional norms are applied with background rules to law, tort law, contract law, property law amount to social welfare rights that include healthcare, housing, labour, etc. (18). These norms are only applied with any real strength to the intimidating power of the state against the individual. Unfortunately, *state action* is a barrier to the maintenance of socioeconomic rights. Therefore, it is nearly impossible to rely on constitutional norms if pension rights are invoked against private parties. Another noteworthy process for the treatment of such disputes between private parties is the "horizontal effect," a back door when social rights are blocked by *state action* (18). One has to learn whether the social rights in question are subject to *state action* or *horizontal effect*. When constitutional norms have a horizontal effect, individuals can rarely invoke this right to block *state action*.

Back to the core argument, may a geriatric patient – apart from other legal proceedings – invoke her/his constitutional "right to health" before national authorities in response to any inconvenience arising from treatment procedures? Or may she/he claim lack of health service on the same basis? Justiciability is another question. Specifically, the weak character of rights and catalogues affects the level of protection before the courts. There is no single and substantive principle determining how courts react when they are asked to enforce rights that are weak in nature. Traditional judiciary resists social welfare rights on the grounds of justiciability objections. However, an objection of this type does not have a basis in legal argument for any court to apply. Inconsistent and non-standardised responses of the courts against justiciability objections remain a grey area in terms of the existence of moral rights. Moreover, from the citizen's side, such a grey area infringes on the principle of legal certainty (8). Consequently, a geriatric patient who invokes the "right to health" does not have "one hundred per cent" reliable legal protection under positive law.

Finally, Dworkin argues that even a perfect constitution may not be helpful in defending a citizen's constitutional rights (8). Many authors, including Dworkin, highlight the position of "conscientious objectors on philosophical grounds," which argues for exercising a moral right even at the expense of a conflict with public authorities, legislation, and adjudication. The scope of the constitutional right provided for citizens in this situation may be vague and ambitious. It is possibly weaker than a constitutional duty such as compulsory military service. No one can clearly tell what the origin of such a weak right is and how it has descended into an invokable moral right (8). According to Dworkin, two paradigms are possible: the first is the narrowed moral rights of the individual by public authorities (e.g., constrained rights of elderly), which later lead to infringement; and second, the widened moral right of individual against public, which later remains an insecure public area to the community.

The first has a social cost. The scope of public liberties such as right to express, freedom to establish union and right to public demonstration is considered at this point. Social welfare rights including right to pension, right to healthcare, and right to accommodation are in the second group. The first group of rights have a strong standing, so that constraining rights with restraining orders causes a serious social cost. The latter, contrarily, has no direct social cost. Constraining



socioeconomic rights has an indirect impact causing socioeconomic cost to the individual right holder, who continues living in a peaceful environment.

Dworkin underlines a point where community rights and individual rights are confused (8). With reference to the famous Criminal Law example, it is not possible to substitute the right to security of a person with minimum standards of accused rights or vice versa. Shortly, accused rights and liberty rights of persons will be neither interchangeable nor competitive. Modern law never proposes to dismiss accused rights for the purpose of maintaining secure streets for citizens. Therefore, the first paradigm collapses.

Does Natural Law Provide Healthcare Rights Among Other Social Rights?

Contemporary natural law theory, analysed by John Finnis, is an innovative understanding subsidiary to Thomas Aquinas after seven centuries. In his book, *Natural Law and Natural Rights* (1980), he reformulated a contemporary theory of natural law. Although his evaluation of ethics is a reference for the next section, his total work on political society, state, and law is a theory of ethics (9).

Finnis opens his argument asking the famous question of the Ancient Greek philosopher Aristotle: "What constitutes a worthwhile, valuable life?". He answers by recommending seven universal "basic goods" of humanity contributing to a fulfilled life: Life, Knowledge, Play, Aesthetic Experience, Sociability, Practical Reasonableness, 'religion'. Specifically, the first one – 'life' – includes every fragment of life that puts a human being in a wellness of self-determination, consisting of bodily health and freedom from pain. The second one - 'knowledge'- includes access to information and not being left uninformed. 'Sociability' includes solidarity between men at a minimum standard of peace and harmony (9).

Focusing on the value prospects by Finnis, the primacy of "life" among other "basic goods" is an important element. Therefore natural law creates, primarily, a natural "right to life" and a "healthy living standard" without bodily harm and pain.

What about the healthy living standard of natural law and other socioeconomic rights? Is there a question of primacy? May the public authority give some social rights superiority and primacy over some other social rights? If yes, what criteria might be applied to create such a classification? Wherever law is separated from morals, values are separated from public order. Leslie Green offers an argument for the inseparability of law and morals (19). Non-maleficence is both a rule of ethics and morals. Moreover, its existence in provisions of penal law, torts law and constitutional law is undeniable. Therefore non-maleficence is a common value for law, ethics and morals. Respect for the principle of *non-maleficence* is a pre-requisite for the healthy living standard of a patient.

What Impact Prevents Authorities from Providing More Intensive Geriatric Medicine and Healthcare on Grounds of Moral Rights and Ethics?

In such a limited and subjectively perceptible world, it is generally believed that moral acts have humanistic features. Morality with deliberate and conscious decision-making cannot be attributed to an animal or a humanistic robot. Even though domestication of animals teaches them to "behave well" or an algorithm can teach a robot to imitate human behaviours, these subjects are not capable of acting with morality. Considering their inability to internalise what they are taught, it is not possible to speak about their moral sense. A *deliberate* and *conscious* act is the consequence of judgement. Such acts are demanded by a certain norm that answers a "why?" question—why we ought to act in a certain way is the root of ethics.

Aristotle's ethics and moral rules involve the *good of human kind* as an instrument to educate humanity. However, traditional ethics also include God's revelation of commands to people and an obligation to God, a reciprocal act of God's act of creation. Even the "divine" doctrine of the *Ancien Régime* provided limited descriptions of what a human being ought to do. The rest of the black hole in this dilemma is left to the human being to make sense of and to set up an ontological hierarchy.

The natural structure of the world presents many beings that live only at the expense of others. For instance, plants consume minerals for their well-being in their environment. However, animals need to consume organic substances. Humans, on the other hand, consume animals and other organic substances under a human-centric view. Issues regarding social justice, allocation of resources, and living conditions indicate that such a dilemma is a uniquely human question. The question produces an ontological hierarchy between various social groups among humans.

Assuming that plants have superiority over animals, animals are superior over plants and other animals, and human beings have superiority over all, according to an ontological hierarchy, is any group of human beings superior to other groups? Does a college student continue his/her free will existence at the expense of miners, fishermen, security forces, test-

pilots, and firemen? Conversely, does a fireman who fails to take the risk of entering a building on fire and survives, do so at the expense of the lives of people who did not survive?

The problem considered in this paper is simpler than the abovementioned situations. The productive work power of the last generation has enabled the prosperous existence of today's people and their elected officials. Therefore, who deserves to exist and to be valued more than the members of this last generation? Specifically, who deserves their health standards and living conditions to be bettered?

In 1993, the World Human Rights Conference adopted The Vienna Declaration and Programme of Action, which declared any form of classification or other means of establishing hierarchy among different types of rights as unacceptable on the basis of human-rights theory, stating the following:

"..... 5. *All human rights are universal, indivisible and interdependent and interrelated. The international community must treat human rights globally in a fair and equal manner, on the same footing, and with the same emphasis. While the significance of national and regional particularities and various historical, cultural and religious backgrounds must be borne in mind, it is the duty of States, regardless of their political, economic and cultural systems, to promote and protect all human rights and fundamental freedoms.....*" (Section 1, para 5)(20).

Conclusion

Considering budgets, society, law, and public services as a chain in social justice, vulnerable groups, especially the elderly in poverty who need public care to further their existence and welfare, are the weakest link in this chain. In order to keep this chain stable, these socio-economic rights holders must receive positive discrimination and support, and legal and *de facto* paternalism must be minimised. Inaction is nothing more than ignorance.

Thankfully, in the last decade, a number of institutional developments have offered great promise for the conduct of ethics in society. A few examples are summarised here to offer a thematic analogy. First, the OECD has proposed a recommendation to improve ethics in public services that seeks clarification of standards in order to improve certainty and public equity (21). It also requires a legal framework and public servants with proper training. Transparency and openness to scrutiny are also pre-requisites to achieving these improvements. Wrongdoing must be prosecuted with fairness and justice. Similarly, the European Union Ombudsman's Office has adopted five principles of public service: commitment to citizens and union, integrity, objectivity, respect for others, and transparency (22).

Principles of Public Services and Older Populations

Additionally, the American Society for Public Service upheld a revised code of ethics, titled "Fundamental Principles of Public Services and Older Populations," laying out the following principles:

1. Advance the public interest where the service is for the public
2. Respect and support government laws and constitution
3. Inform the public and encourage active engagement
4. Treat all persons fair, just, and equal, while respecting personal differences, freedoms, and rights
5. Provide accurate, comprehensive, timely, and honest information
6. Adhere to the highest standards of conduct to inspire confidence in and trust to public service
7. Promote ethical organisations
8. Advance professional excellence

The most prominent elements common in the three sets of institutional ethical standards are their moral values and their ethical basis. These values are incorporated into strong documents such as human rights charters, constitutions, and multi-national covenants. However, protection mechanisms still fail.

In many cases, directly invoking constitutional or human rights receives no remedy before authorities. The final and central dilemma authorities have to face is why the authorities ought to codify constitutional values under secondary legislative instruments, such as codes of conduct, recommendations, directives, and so on. Is there any need for a secondary administrative act to remind us of the existence of the most supreme rule of a legal system? Such a need is a result of failures to apply the strong provisions of positive law that are derived from natural law. Public authorities, the judiciary, and public opinion are still not enlightened with respect to the dangers of the gradual disappearance of high values of humanity as positive law is divinised. This is a grave mistake, as Schlink underlined the emergence of these dangers in *The Third Reich*. This analysis proposes that the principle of *Primum non nocere* is integrated into natural law that is crystallised with ethical and moral values. Finally, this paper has sought to establish an unexpected yet necessary link between values protected by natural law and geriatrics, with a view to "*improving the function, independence and quality of life of older persons*" (23).

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Bahri TEKER[1]
Mehmet AĞIRMAN[2]
Tuğrul ÖRMECİ[3]
Mehmet TEZER[4]
Ali MERT[5]
Engin ÇAKAR[2]

CASE REPORT

PARAPLEGIA IN AN ELDERLY PATIENT DUE TO POTT'S DISEASE

ABSTRACT

Spinal tuberculosis (Pott's disease) is still an important problem in many countries and may result in severe neurological deficits. Pott's paraplegia can occur in the early period of the disease or many years later. Pott's disease usually occurs in the thoracic vertebrae and may cause neurological symptoms as a consequence of bone destruction and spinal cord compression. In this article, we present the case of a 73-year-old diagnosed with Pott's paraplegia who was referred to our clinic with back pain. He had been previously diagnosed with pulmonary tuberculosis and had received anti-TB therapy. After five weeks of an intensive rehabilitation program, the patient could walk independently and was discharged with minimal dependency. We conclude that there should be more awareness of the possibility of non-traumatic spinal cord injuries in elderly patients.

Key Words: Paraplegia; Tuberculosis, Spinal; Rehabilitation; Aged.

OLGU SUNUMU

YAŞLI BİR HASTADA POTT HASTALIĞINA BAĞLI GELİŞEN PARAPLEJİ OLGUSU

ÖZ

Spinal tüberküloz (Pott hastalığı) günümüzde halen bir çok ülkede önemli bir sağlık sorunudur ve ağır nörolojik kayıplara neden olabilmektedir. Pott hastalığına bağlı parapleji, hastalığın erken dönemlerinde yada yıllar sonra ortaya çıkabilmektedir. Genellikle torasik vertebralarda ortaya görülmekte, kemik yıkımı ve spinal kord basısına bağlı olarak da nörolojik bulgulara sebep olabilmektedir. Bu makalede, kliniğimize bel ağrısı ile yönlendirilen, Pott paraplejisi tanısı konan 73 yaşındaki bir hasta sunulmaktadır. Hasta daha öncesinde pulmoner tüberküloz tanısı ile takip edilmekte ve anti-tüberküloz tedavi almaktaydı. Hasta beş haftalık yoğun rehabilitasyon programından sonra bağımsız olarak yürüyebildi ve minimal bağımlı olarak taburcu edildi. Sonuç olarak yaşlı hastalarda travmatik olmayan spinal kord yaralanmaları ihtimali konusunda dikkatli olunmalıdır.

Anahtar Sözcükler: Parapleji; Spinal Tüberküloz (Pott hastalığı); Rehabilitasyon; Yaşlı.

İletişim *(Correspondance)*

Mehmet AĞIRMAN
Nisa Hospital Infectious Diseases and Clinical Microbiology
İSTANBUL

Tlf: 444 70 70
e-posta: mehmetagirman@yahoo.com

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[1] Nisa Hospital, Infectious Diseases and Clinical Microbiology İSTANBUL
[2] Medipol University Hospital, Physical Medicine and Rehabilitation İSTANBUL
[3] Medipol University Hospital, Radiology İSTANBUL
[4] Medipol University Hospital, Orthopedics and Traumatology İSTANBUL
[5] Medipol University Hospital, Internal Medicine İSTANBUL

Introduction

Tuberculosis (TB) is divided into two sub-groups, pulmonary and extra-pulmonary, according to clinical form. It remains a serious problem in developing countries. Bone and joint tuberculosis is most frequently seen in the spine and includes 1% of all tuberculosis cases (1). Pott's disease (tuberculosis of the spine–spondylodiscitis) is one of the most important sources of non-traumatic spinal cord lesions, after spinal tumors (2). Pott's disease usually occurs in the thoracic vertebrae and may cause neurological symptoms as a consequence of bone destruction and spinal cord compression. Although the incidence decreases with age, trauma is still the most common reason for spinal cord injuries in elderly people (3). In this article, we report a case with non-traumatic spinal cord injury associated with tuberculosis spondylodiscitis and a successful rehabilitation outcome after surgery.

Case

A 73-year-old male patient who had had back pain for three months was referred to our clinic from the infectious diseases department. He had been previously diagnosed with pulmonary tuberculosis and had been given anti-TB therapy (isoniazid, rifampicin, pyrazinamide and ethambutol) for five months. He experienced an increase in back pain with motion and walking. There was tingling and numbness in both legs. Over the past month, he had complained of difficulty walking and bilateral knee joint contractures. On sensory examination, he had bilateral L2, L3, L4 and L5 hypoesthesia, and anesthesia in the S1 dermatome with pin prick and light touch tests. On motor examination, bilateral L2 and L3 muscle strength was 2/5, and L4, L5 and S1 muscle strength was 1/5. In laboratory analyses, sedimentation was 32, Hb was 13.8 g/dL, WBC was 7.500 mm^3, platelets were 317,000 mm^3, and CRP was 1.68 mg/L. Pathological reflexes included bilateral clonus and he had 30^0 contractures in both knees. In magnetic resonance imaging (MRI), there were compression fractures in the D11 and D12 vertebral bodies, an epidural abscess located on the anterior epidural space and a spinal cord injury at this level (figure 1, figure 2). The patient was operated for decompression and posterior fusion. The culture of the operated material was positive for M. Tuberculosis. After surgery, the patient was hospitalized in the physical medicine and rehabilitation clinic. On initial examination after surgery, the patient's ASIA classification was C. The patient was mobilized by turning on both sides, and isometric muscle strength exercises were started for the lower limb, abdominal and pelvic muscles after the first postoperative day. The patient was seated as soon as possible and a corset was used while sitting and standing. Respiratory exercises, passive range of motion, and active and active-assistive isotonic strengthening exercises were done and electrical stimulation was applied to the back and limb muscles. After a five-week intensive rehabilitation program, the patient could walk independently with a walker device. His Barthel index was 70 (moderate dependency) at the beginning of treatment and rose to 95 (minimal dependency) by the end of treatment. At discharge, the patient's ASIA classification was D.

Discussion

Spinal tuberculosis is still an important problem in many countries and may result in severe neurological deficits. Pott's paraplegia can occur in the early period of disease or many years later (4). Rehabilitation outcomes and improvement after surgery are better for early onset Pott's paraplegia than for late onset (5). Therefore, we report this case of our patient whose rehabilitation was successful and who recovered well from paraplegia.

Ten percent of patients with spinal tuberculosis may develop paraplegia (5). If neurological symptoms present after spinal tuberculosis, early diagnosis of spinal cord injury is important and a spinal cord compression should be suspected on examination and must be confirmed by radiologic imaging.

In our case, the patient complained of back pain and difficulty walking due to lower limb weakness. According to the literature, fever may occur frequently, in addition to pain and neurological deficits (6). To confirm the diagnosis, radiological images (especially MRI) are useful. Direct radiography is positive for only one third of patients (7). In our patient's direct radiography, the destruction of anterior contours and also increased radiolucency of vertebral bodies were seen, and in the magnetic resonance investigation compression and myelomalacia were seen.

The treatment of Pott's disease for cases who have a neurological deficit and severe spinal deformity is early surgical decompression and fusion. A radiological finding of cord compression alone is not an indication for emergency surgery. If there are light and non-progressive neurological signs, most authors suggest conservative management (1,8,9). Therefore, early surgical intervention in selected patients provides better clinical recovery with intensive rehabilitation. Functional

recovery varies between 50% and 90%, according to different authors (10). In a study of 47 patients, early and long-term (6 month) rehabilitation after surgery showed good improvements in mobility, motor and functional scores of patients both with and without surgery (7). In a study that evaluated non-traumatic spinal cord injury due to Pott's paraplegia or other causes, Gupta et al. reported significant functional recovery after a rehabilitation period (2).

The primary cause of spinal cord injury in elderly patients is trauma caused by falls. The absence of trauma in etiologies such as infections may delay the diagnosis; this puts the patient at more risk for neurological deficits and reduced quality of life. Elderly people have less physiological capacity than younger people. Even though the spinal cord injury may be of the same severity, expected rehabilitation outcomes are poorer in elderly individuals (3).

According to the literature, in cases of paraplegia for non-traumatic causes in elderly people, we can expect a longer hospitalization time and rehabilitation period than for younger people (11). To our knowledge, there are no published studies that specifically address Pott's paraplegia in elderly patients. In this case, early treatment increased the health outcomes of our patient. In the rehabilitation program, he was mobilized as soon as possible to prevent pressure sores. Isometric and isotonic exercises were performed in the early period, as tolerated. He improved after five weeks of intensive rehabilitation and was discharged with minimal dependency.

In conclusion, Pott's disease is still widespread in developing countries and can cause paraplegia due to spinal cord injury. Especially in elderly patients, there should be more awareness of non-traumatic spinal cord injuries. With early diagnosis, surgical treatment and intensive rehabilitation, patients' functional status can be successfully improved.

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Dilek ARPACI[1]
Aysel Gürkan TOÇOĞLU[2]
Bilal Seyyid AÇIKGÖZ[2]
Ali TAMER[2]

Case Report

HYPOGLYCEMIA CAUSED BY CIPROFLOXACIN IN A NON-DIABETIC ELDERLY PATIENT: A CASE REPORT

Abstract

Fluoroquinolones, a commonly used class of antibiotics, can impair glucose homeostasis. Hypoglycemia may be life-threatening in non-diabetic elderly patients with renal impairment. An 80-year-old female patient was admitted to the emergency department with hypoglycemia. The patient was not a diabetic and did not use antidiabetic drugs. Three days prior, she had received ciprofloxacin for a urinary tract infection. During hypoglycemic process, her insulin level was not suppressed. At follow-up in inpatient service, her insulin level had returned to the normal range. Her serum cortisol level was normal, and pancreatic imaging was normal. After ciprofloxacin was discontinued, no further hypoglycemic episodes occurred. Physicians should be careful in prescribing fluoroquinolones in older patients who are prone to hypoglycemia. Moreover, drug-related causes should be considered in cases of unexplained hypoglycemia.

Key Words: Aged; Hypogylcemia; Ciprofloxacin.

Olgu Sunumu

DİYABETİK OLMAYAN YAŞLI BİR HASTADA SİPROFLOKSASİNİN NEDEN OLDUĞU HİPOGLİSEMİ: BİR VAKA SUNUMU

Öz

Antibiyotiklerin yaygın olarak kullanılan bir sınıfı olan florokinolonlar, glukoz dengesini bozabilir. Böbrek yetersizliği olan non-diyabetik yaşlılarda florokinolon kullanımında (özellikle siprofloksasin)hipoglisemi hayatı tehdit edici olabilir. Seksen yaşında kadın hasta acil birimine hipoglisemi ile başvurdu. Hasta diyabetik değildi ve antidiyabetik ilaç kullanmıyordu. Üç gün önce idrar yolu enfeksiyonu için siprofloksasin almıştı. Hipoglisemik süreç boyunca hastanın insülin düzeyi baskılanmadı. Hastanın yatan hasta servisinde yapılan takiplerinde insülin düzeyi normal aralığa döndü. Serum kortizol düzeyi normaldi, ve pankreas görüntülemesi normaldi. Siprofloksasin kesildikten sonra başka hipoglisemi atakları olmadı. Doktorlar hipoglisemiye meyilli olan yaşlı hastalara florokinolon reçete ederken dikkatli olmaları gerekir. Ayrıca, açıklanamayan hipoglisemi durumlarında ilaç-ilişkili nedenler akla gelmelidir.

Anahtar Sözcükler: Yaşlı; Hipoglisemi; Siprofloksasin.

İletişim *(Correspondance)*

Dilek ARPACI
Sakarya Üniversitesi Eğitim Araştırma Hastanesi
Endokrinoloji Kliniği SAKARYA

Tlf: 0264 255 08 65
e-posta: drarpaci@gmail.com

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[1] Sakarya Üniversitesi Eğitim Araştırma Hastanesi Endokrinoloji Kliniği SAKARYA
[2] Sakarya Üniversitesi Eğitim Araştırma Hastanesi İç Hastalıkları Kliniği SAKARYA

Introduction

Fluoroquinolones are among the most commonly used antimicrobial drugs for the treatment of community- and hospital-acquired infections because of their broad spectrum of activity, oral application, good tolerance and safety, and few adverse effects (1). However, some fluoroquinolones have been withdrawn from the market because of adverse effects. For example, temafloxacin causes hemolysis and hypoglycemia (2), and trovafloxacin causes hepatotoxicity (3,4).

Disturbances in glucose homeostasis are one of the drug's most relevant side effects. Both hypoglycemic and hyperglycemic episodes may be observed during fluoroquinolone treatment. Hypoglycemia is rare but life-threatening and can be fatal (5,6). Quinolone-induced hypoglycemia has been reported for all fluoroquinolones (7). Cases of hypoglycemia are particularly common in gatifloxacin treatment of older and diabetic patients (8). Aspinall et al. reported that hypoglycemia is more frequent during gatifloxacin treatment than with other fluoroquinolones. Levofloxacin also poses an increased risk of hypoglycemia (8). The study authors expressed concerns about the significant risk associated with the use of levofloxacin.

Most hypoglycemic episodes are related to interactions with oral antidiabetic drugs and depend on the potentiation of oral antidiabetic drugs, such as sulfonylureas or insulin, in older diabetic patients (9-14). However, fluoroquinolones may induce hypoglycemia in some non-diabetic patients (15). Hypoglycemia typically occurs within the first 3 days of fluoroquinolone therapy.

Some of the factors that affect the development of hypoglycemia include age, renal dysfunction, inadequate nutrition, hepatic failure, malignancy and corticosteroid use (8). In the literature, ciprofloxacin is associated with the lowest risk of hypoglycemia. However, rare cases of hypoglycemia have been described in elderly diabetic patients (9). In this case report, we present a patient without diabetes who experienced hypoglycemia associated with ciprofloxacin use.

Case Report

An eighty-year-old female patient without any history of diabetes admitted to infectious disease policlinics with the complaint of pain during urination. She was diagnosed to have urinary tract infection and was prescribed ciprofloxacin (500 mg orally twice per day).On the third day of antibiotic treatment, she was brought to emergency room by her husband because of confusion, diaphoresis and slurred speech. In the emergency room her blood pressure was 100/70 mmHg, body temperature was 36.5 °C and pulse was 98 beats/min. Her respirations were deep and were 22/minute. Capillary blood glucose level measured by finger-stick was 47 mg/dl. After rapid administration of 20% glucose solution, blood samples were taken for further measurement of hormonal parameters (cortisol, thyroid function tests, insulin and c peptide). Dextrose infusion was continued until the blood glucose returned to normal and confusion dissolved. Cranial CT was ordered after neurology consultation and we didn't detect any pathological finding.

The laboratory findings were as follows: urea:79 mg/dl, creatinine: 2.4 mg/dl, serum sodium: 140 mEq/L, potassium: 5.8 mEq/L, insulin 42.4 µU/ml (3-17 µU/ml) and c-peptide 16.41 ng/ml (normal range 0.78-5.9 ng/ml), aspartate aminotransferase/alanine aminotransferase level 34/44 IU/L.

In the past medical history, she had hypertension for ten years and has been treated with valsartan plus hydrochlorothiazide combination. Three days prior to presentation, a quinolone was added to her medications. In the differential diagnosis of hypoglycemia, we questioned the patient and she declared that she didn't use any oral anti-diabetic agent accidently or consciously. Since she had hypoglycemia, low blood pressures and hyperpotassemia at the time of admission, we searched for a possible adrenal insufficiency and it was excluded since serum cortisol level was measured as 34 µg/dl (normal range 3.7-19 µ). Because of the elevated insulin and c-peptide levels, we performed pancreatic imaging, and it was normal.

After 4 hours of dextrose infusion, her consciousness returned to normal. There was no hypoglycemic attack over the following five days. We sent blood samples to measure insulin levels during the normoglycemic period; her insulin level was 13.3 µU/ml (normal range 3-17 µU/ml). For her urinary tract infection, we obtained a urine culture and prescribed second-generation cephalosporin adjusted to creatinine clearance. Treatment for UTI was continued for one week and stopped. Urine culture was negative after the treatment. During the follow up, her glomerular filtration rate was low as 49 ml/h and her serum potassium level was 5.8-5.4 mg/dl. Given the low creatinine clearance and elevated potassium level, we changed her antihypertensive drug to a calcium channel blocker. In routine laboratory evaluation, we observed subclinical hyperthyroidism and performed thyroid ultrasonography revealing multinodular goiter. After thyroid scintigraphy, thyroid fine needle aspiration was performed. Since the pati-

ent did not exhibit any hyperthyroid symptoms; we advised her to reduce the iodine in her diet. After discontinuing ciprofloxacin, we did not observe any hypoglycemic episodes.

Discussion

Fluoroquinolone-induced hypoglycemia has been described infrequently, especially in older diabetic patients with renal failure who use sulfonylurea; fluoroquinolones are known to potentiate oral antidiabetic drugs (12,13). Renal failure predisposes patients with or without diabetes to hypoglycemia. This results from numerous factors, including chronic malnutrition, anorexia, decreased renal clearance, decreased drug clearance, decreased clearance of endogenous insulin and decreased renal gluconeogenesis. Aspinall et al. (8) studied whether drug class affected the glucose disturbances associated with fluoroquinolones; in their study, only 25.1% of patients exhibited diabetes. They reported that the odds ratio for severe hypoglycemia with gatifloxacin was 4.3, while with levofloxacin and ciprofloxacin the ratios were 2.1 and 1.1, respectively, in diabetic patients. In patients without diabetes, the odds ratio was 1.9 for gatifloxacin, 1.6 for levofloxacin, and 0.7 for ciprofloxacin. In addition, hypoglycemia requiring hospitalization was more common with gatifloxacin and levofloxacin than with ciprofloxacin (8). According to this study, ciprofloxacin was safer than the other drugs. However, our patient used ciprofloxacin and was neither a diabetic nor did she use oral antidiabetic drugs.

Mohr et al. (15) found that there were no significant differences in the risk of dysglycemia between gatifloxacin and levofloxacin. In contrast to our patient, the authors did not observe any hypoglycemic events with ciprofloxacin use. In another study, published by Park-Whylli et al., the odds ratio for hypoglycemia was 4.3 in gatifloxacin-treated patients and 2.9 in levofloxacin-treated patients; however, there was no risk associated with moxifloxacin, ciprofloxacin or cephalosporins (6). In a further study, there was no risk of dysglycemia with ciprofloxacin. This study included 17,108 patients receiving a fluoroquinolone, and the dysglycemia rates were as follows: gatifloxacin 1.01%, levofloxacin 0.93%, ceftriaxone 0.18%, and ciprofloxacin 0% (15).

The mechanism of fluoroquinolone-induced hypoglycemia is similar to that of sulfonylureas, which stimulate insulin secretion by inhibiting K-ATP channels in the islets of Langerhans. This inhibition leads to the depolarization of the beta cell membrane and the opening of voltage-dependent calcium channels, allowing calcium movement into the cells with subsequent insulin release. Hany et al. reported that the enhancement of insulin secretion is a group effect of fluoroquinolones and depends on their ability to block K-ATP channels in pancreatic beta cells. As we mentioned above, chronic renal failure itself may predispose patients to hypoglycemia whether or not they are diabetic. The conditions underlying this relationship include chronic malnutrition, anorexia, vomiting, decreased renal clearance, decreased drug clearance, insulin clearance and diminished renal gluconeogenesis. Several authors have reported levofloxacin-induced hypoglycemia in chronic renal failure patients (13, 14).

Ciprofloxacin, like the other fluoroquinolones, is primarily eliminated through the kidneys. Hypoglycemia-induced ciprofloxacin has been reported in diabetic patients using oral hypoglycemic drugs. There may be an interaction between ciprofloxacin and antidiabetic drugs.

We believe that the cause of hypoglycemia in our patient was her moderate renal dysfunction and the use of ciprofloxacin. We used the Naranjo adverse drug reactions (ADR) scale to document the possibility of a relationship between ciprofloxacin and hypoglycemia. Our score was four, indicating that ciprofloxacin-related hypoglycemia is a possibility. We did not assess the following parameters in our patient: response to placebo, rechallenges with ciprofloxacin, and the blood level of ciprofloxacin. Our patient was older and exhibited renal impairment, but she exhibited no history of diabetes or any use of oral antidiabetic drugs.

Although fluoroquinolones are frequently used, 80.4% of physicians are unaware of hypoglycemia induced by fluoroquinolone. Hypoglycemia in elderly patients is a life-threatening problem, especially in the case of the administration of oral antidiabetic drugs in the presence of chronic renal failure and inadequate nutrition. Hypoglycemia can cause irreversible brain injury or dementia. Although hypoglycemic episodes may resolve, patients can suffer serious health problems. Therefore, the condition requires hospitalization.

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TÜRK GERİATRİ DERGİSİ 2014 YILI YAZAR DİZİNİ

TURKISH JOURNAL of GERIATRICS AUTHOR INDEX for 2014

Aydın ACAR: 152
Bilal Seyyid AÇIKGÖZ: 426
Müjdat ADAŞ: 234
Mehmet AĞIRMAN: 423
Asliddin AHMEDALİ: 138
Metin AHMET: 119
Ramazan AKÇAN: 350
Betül AKDAL: 316
Kenan AKGÜN: 214
Zümrüt AKGÜN ŞAHİN: 278
Belgin AKIN: 379
Özgül AKIN ŞENKAL: 389
Tezcan AKIN: 356
Arif AKKAYA: 57
Nuray AKKAYA: 242
Haldun AKOĞLU: 138
Ersin AKSAY: 57
Songül AKSOY: 389
İlknur AKTAŞ: 214, 218, 305
Recep AKTİMUR: 338
Sude Hatun AKTİMUR: 338
Abdulvahap AKYİĞİT: 285
Müfit AKYÜZ: 331
Hülya ALBAYRAK: 312
Hakan ALKAN: 242
Hasan ALTINKAYNAK: 44
H. Özge ALTINTAŞ: 256
Ahmet ALTUN: 44
Umut ALTUNÖZ: 256
Berna ARDA: 188
Füsun ARDIÇ: 242
Sadık ARDIÇ: 223
Akif Enes ARIKAN: 8
Dilek ARPACI: 200, 426
H. Kimiaei ASADİ: 86
Halil AŞCI: 125
Cem ASLAN: 308
Fatma ATALAY: 262
Emrah ATAY: 77, 410
Bekir ATİK: 228
Akkan AVCI: 138
Mehmet Oğuzhan AY: 23
Semiha AYDIN: 324
Yusuf AYDIN: 63
Remzi AYGÜN: 1
Çiğdem AYHAN: 157
Aydan AYTAR: 404
Emre BAĞCI: 262
Nadi BAKIRCI: 180
Süleyman BALDANE: 205
Soysal BAŞ: 308
Fatma BAŞALAN İZ: 410
Elife BAŞKAN: 312
Gülbahar BAŞTUĞ: 256
Ali BATUŞ: 272
Fatih BAYGUTALP: 50
Atıf BAYRAMOĞLU: 210
Sinan BECEL: 138
Taner BEKMEZCİ: 234
Mehmet BEYAZOVA: 29
Bülent Çağlar BİLGİN: 356
Özlem BİLİR: 210
Aytaç BİRİCİK: 345
Selçuk BÖLÜKBAŞI: 1
Turgay BORK: 361
Füsun BOZKIRLI: 366
İrem BUDAKOĞLU: 1
Yusuf BÜKEY: 8
Erdoğan BÜLBÜL: 312
Mustafa BULUT: 218
Serap BULUT: 205
Öznur BÜYÜKTURAN: 157
Engin ÇAKAR: 423
Yakup Tolga ÇAKIR: 172
Hüseyin CAN: 172
Fatma Nihan CANKARA: 125
Nergis CANTÜRK: 99
Mehmet CAVLAK: 350
Melih ÇAYÖNÜ: 152
Cansu ÇELİK: 397
Mustafa ÇELİK: 272
Mustafa CENGİZ: 134
Süleyman ÇETİKKÜNAR: 338
Erdinç CEYLAN: 44
Kah Wai CHAN: 90
İbrahim CİCİOĞLU: 262
Emine ÇİNİCİ: 44
Elif ÇOLAK: 338
Mehmet ÇÖLBAY: 200
Behçet COŞAR: 1
Hülya COŞKUN: 63
Özlem COŞKUN: 1
Seda DAĞAR: 57
Ayşe DEMİR ATILGAN: 262
Mehmet Derya DEMİRAĞ: 338
Mehmet Ersegün DEMİRBOĞAN: 373
Tuba DEMİREL: 379
Gülen DEMİRPOLAT: 312
Düriye Deniz DEMİRSEREN: 119
Serpil DEREN: 108, 196
Alper DİLLİ: 316
Elif DOĞAN BAKI: 373
Ersoy DOĞAN: 299
Nurettin Özgür DOĞAN: 23
Özge DUMAN ATİLLA: 57
Semra DURAN: 316
Nazlı DURMAZ: 256
Sertaç DÜZER: 285
Fulya EKER: 152
Levent EKER: 404
Yüksel ELA: 373
Selma EMRE: 119
Candaş ERÇETİN: 345
Taner Kemal ERDAĞ: 299
Gülnihan EREN: 134
Dilek ERGÜN: 223
Recai ERGÜN: 223
Zerrin ERKOL: 99, 249
Celalettin EROĞLU: 113
Ebru ERSOY ORTAÇ: 223
Muhammed Eren ERSÖZ: 228
Gökhan ERSUNAN: 210
Fatma ETİ ASLAN: 180
A. Asadi FAKHR: 86
Gülin FINDIKOĞLU: 242
Celil GÖÇER: 152
Nasrin GOLMOGHANİ-ZADEH: 262
Ali GÖRAL: 308
Emine GÜL BALDANE: 205
Osman Bilgin GÜLÇİÇEK: 345
Ali İhsan GÜLEÇ: 312
Müge GÜLEN: 23
Çağatay GÜLER: 157
Melis GÜLTEKİN: 134
Mehmet GÜNAY: 262
Duru GÜNDOĞAR: 125
Selhan GÜRKAN: 299
Murat GÜRKAYNAK: 134
Hakan GÜZEL : 338, 356
Şeminur HAZNEDAROĞLU: 1
Eyüp Ruşen HEYBET: 350
Mübin HOŞNUTER: 308
Ruth E. HUBBARD: 90
Pervin HÜRMÜZ: 134
Ferhat İÇME: 138
Ferhat İÇME: 23
Önder İLGİLİ: 188
Murat İNANIR: 331
Nevin İNCE: 321
Süleyman H. İPEKÇİ: 205
Arzu İRBAN: 180
Ali Levent IŞIK: 8
Dağhan IŞIK: 228, 308
Ahmet KAHRAMAN: 228
Şahin KAHRAMANCA: 356
Bünyamin KAPLAN: 113
Gonca KARA GEDİK: 205
Gülendam KARADAĞ: 70
Yahya KARAMAN: 1
Nurettin KARAMANSOY: 249
Hulagu KARGICI: 356
Oskay KAYA: 356
Kamil KAYAYURT: 210
Levent KEBAPCILAR: 205
Erol KELEŞ: 285
Pembe KESKİNOĞLU: 143
Hamit Sırrı KETEN: 272
Fadime KILINÇ: 119
Nuray KIRDI: 157
Günay KIRKIM: 299
Sertaç Argun KIVANÇ: 44
Nezihe KIZILKAYA BEJİ: 324
Hatice Serap KOÇAK: 70
Serdar KOKULU: 373
Aysun KORCAN GÖNEN: 234
Esra Akın KORHAN: 70
Tanzer KORKMAZ: 249
Ayşen KÖSE: 389
Bertan KÜÇÜK: 356
Özlem KUDAŞ: 63
Rauf Oğuzhan KUM: 152
Mehmet Ali KURNAZ: 172
Pınar KURT: 143
Aydan KURTARAN: 331
Neslihan KURTUL: 113
Celal KUŞ: 272
Rıza KUTANİŞ: 345
Aykut LALE: 350
Gönen MENGİ: 29
Ali MERT: 423
Reci MESERİ: 15
Natalie A. De MORTON: 404
Serpil MUNGAN DURANKAYA: 299
Kerim MUNİR: 188
Başak MUTLU: 299
Erdem İlker MUTLU: 417
Ezgi MUTLUAY: 164
Cem NAZİKOĞLU: 218
Rukiye NUMANOĞLU TEKİN: 397
Aysun ODABAŞI BALSEVEN: 350
Arzu OĞUZ: 113
Keriman OĞUZ: 103
Mustafa ÖKSÜZ: 228
Osman Okan OLCAYSÜ: 44
Gülşen OLGUN İZMİRLİ: 125
Soner ÖLMEZ: 272
Elif ÖNDER: 63

Rıfkı ÖNDER: 172
Okan ORHAN: 113
Tuğrul ÖRMECİ: 423
Mehmet Uğur ÖZBAYDAR: 234
Murat ÖZCAN: 8
Özal ÖZCAN: 373
Barçın ÖZCEM: 108, 196
Sabri ÖZDAŞ: 338
Cengiz ÖZDEMİR: 223
Erguvan Tuğba ÖZEL-KIZIL: 256
Necdet ÖZER: 285
Gülay ÖZGEHAN: 356
Feyza Ünlü ÖZKAN: 305
Nuraydın ÖZLEM: 338
Zeynel ÖZTÜRK: 152
Ateş ÖZYEĞİN: 8
Özden ÖZYEMİŞÇİ TAŞKIRAN: 262
Gökhan ÖZYİĞİT: 134
Deniz PALAMAR: 214
Serap PARLAR KILIÇ: 70
Şeyda PEZEK AYDIN: 366
Cahit POLAT: 285
Ilgın SADE: 331
Hasan ŞAHİN: 152
Mutlu ŞAHİN: 278
Şule ŞAHİN ONAT: 35
Öner SAKALLIOĞLU: 285
Merih SARIDOĞAN: 214
Ayşe Banu SARIFAKIOĞLU: 103: 234
Pervin SARIKAYA: 23
Nurhan SARIOĞLU: 312
Ayşe SARSAN: 242
Salim SATAR: 138
Filiz SAYAR: 290
Barın SELÇUK: 331
Kazım ŞENEL: 50
Bülent SERBETCİOĞLU: 299
Özgür SEVİNÇ: 242
Sema SEZGİN GÖKSU: 113
Savaş SEZİK: 57
M. Esmaeil SHAHRZAD: 86
Ayşe Duygu ŞİLTE: 305
Hatice ŞİMŞEK: 15
Remziye Gül SIVACI: 373
Süleyman SOLAK: 345
Ali SOLMAZ: 345
Mehmet SONBAHAR: 172
Yonca SÖNMEZ: 125
Burak SUBAŞI: 285
Mustafa Haki SUCAKLI: 272
Ali TAMER: 200, 426
Nihal TAŞ: 1
Arzu TAŞDEMİR: 113
Bahri TEKER: 423
Serkan TEKSÖZ: 8
Mehmet TEZER: 423
Aysel Gürkan TOÇOĞLU: 426
Mehmet TOKDEMİR: 361
Murat TONBUL: 234
Oya TOPUZ: 242
Naciye Füsun TORAMAN: 77
Osman Baran TORTUM: 8
Ali Rıza TÜMER: 350
Ferhat Turgut TUNCEZ: 361
Abdurrahim TURKOGLU: 361
Emine Handan TÜZÜN: 404
Demet UÇAR: 35
Reyhan UÇKU: 15, 143
Bahire ULUS: 180
Kıvılcım UPRAK: 95
Gönül URALOĞLU: 331
Esma USLU: 312
Yasemin USLU: 180
Emin UYSAL: 345
Hanife UZEL: 373
Işıl ÜSTÜN: 218
Mustafa Ümit UĞURLU: 95
Aysun ÜNAL: 103
Dilek ÜNAL: 113
Feyza ÜNLÜ ÖZKAN: 218
Sibel ÜNSAL DELİALİOĞLU: 35
Erdem YAKA: 143
Yavuz YAKUT: 157
Elif YALÇIN: 331
Hakan YAMAN: 77
Bahar YANIK: 312
Özcan YAVAŞİ: 210
Erkan YAVUZ: 345
Feyza YAYCI: 108, 196
Selçuk YAYLACI: 200
Gözde YAZICI: 134
Şevket Cumhur YEĞEN: 95
Görsev YENER: 143
Şükriye YEŞİLOT: 125
İlhan YETKİN: 1
Hakan YİĞİTBAŞ: 345
Aliye YILDIRIM GÜZELANT: 103, 234
Kadir YILDIRIM: 338
Mahmut Şerif YILDIRIM: 350
Necmettin YILDIZ: 242
Esra YILDIZHAN: 63
Ela YILMAZ: 180
Fikriye YILMAZ: 397
Simge YILMAZ: 15
Ülkü YILMAZ: 200
Deniz YÜCE: 134
Gülbahar YÜCE: 223
Serdar YÜCE: 228
Nurullah YÜCEL: 180
Serpil YÜKSEK OKUMUŞOĞLU: 29
İnci YÜKSEL: 404
Sabire YURTSEVER: 164
Zeliha Özlem YÜRÜK: 404
Yücel YÜZBAŞIOĞLU: 23
Faruk ZORLU: 134

TÜRK GERİATRİ DERGİSİ 2014 YILI KONU DİZİNİ

Abdominal Obezite; 15
Acil Servis; 57, 249
Adli Olgular; 249
Adli Tıp; 361
Ağrı; 95, 180
Alzheimer Demans; 285
Anemi, 63
Anestezi İyileşme Periyodu; 86
Anestezi; 86, 373
Anksiyete, 164
Apandisit; 345
Araştırma; 188
Arteryel Karboksihemoglobin düzeyi; 223
Az Görme; 44
Bakım Verenler; 256
Bazal Hücreli; 228
Bedensel Etkinlik; 77
Bel Ağrısı; 214
Bellek; 290
Bilateral Diz Protezi; 373
Bilinç Monitörleri; 86
Cilt Kanseri; 308
Çoklu İlaç Kullanımı; 172
D Vitamini Eksikliği; 8
Davranış; 299
Davranışsal Tedavi; 324
Değerlendirme (Sağlık Hizmeti); 410
Deli Bal; 210
Deliryum; 57
Demans; 143, 256, 350
Demir Eksikliği; 63
Denge; 157, 410
Depresyon; 35, 70, 180
Diyabet; 278
Diyabetik Nöropati; 312
Diz Osteoartriti; 404
Dumansız Tütün; 272
Düşme; 138, 242, 410
Düşmeler; 157
Egzersiz; 29, 77, 262, 410
Etik; 188
Fekal İnkontinans; 331
Femoral Nöropati; 218
Fizik Tedavi; 234
Geçici İskemik Atak; 23, 210
Geriatrik Değerlendirme; 404
Glioblastom; 134
Günlük Yaşam Aktiviteleri; 278
Hafif Kognitif Bozukluk; 143
Hareket Kısıtlılığı; 404
Hemipleji; 50
Hemşirelik; 379
Hepatik Ekinokok; 312
Hidatidozis; 312
Hipoglisemi; 200, 426
Hipokalsemi; 8
Hukuki Ehliyet/Mevzuat ve İçtihat; 350
Huzurevi; 262
İlaç Uyumu; 125
İliak; 214
İnguinal Herni; 338
İnme; 23, 331
İşitme Cihazı; 152, 299, 389
İşitme Kaybı; 205, 285, 299
Isoflurane; 86
Kadın; 324
Kamptokormia; 103
Kanser; 164
Kardiyak Cerrahi; 108, 196

Kardiyovasküler Hastalık; 15
Karsinom, 228
Kazaya Bağlı Düşmeler; 410
Kemiğin Paget Hastalığı; 205
Kemik Kırığı; 200
Ketleme; 290
Kişisel Memnuniyet; 389
Klinik Staj; 1
Kognitif Tarama Testi; 143
Komorbidite; 338
Konstipasyon; 331
Korku; 157, 410
Körlük; 44
Koroner Anjiografi; 218
Kronik Ağrı; 164
Kronik Obstruktiktif Akciğer Hastalığı; 223
Küçük Hücreli Dışı Akciğer Kanseri; 113
Laktik Asidoz; 108, 109
Lenfatik Metastaz; 356
Levobupivakain; 366
Lökosit Sayısı; 113
Lökosit; 345
Lumbar; 214
Magnetic Resonans Görüntüleme; 95, 316
Melanom; 228
Meme Kanseri; 356
Mezuniyet Öncesi Tıp Eğitimi; 1
Mortalite; 57
Multidisipliner İletişim;1
Nöbet; 200
Nörojenik Bağırsak; 331
Nötrofil; 345
Obturator Herni; 95
Odyolojik Rehabilitasyon; 389
Öfke; 299
Ölçekler; 157
Ölüm; 361
Orta Yaşlı; 223
Otopsi; 99, 361
Öz Bakım; 278
Özürlülük Değerlendirme; 44
Palmoplantar Hiperkeratoz; 321
Parapleji; 423
Parathormon; 8
Parkinson Hastalığı; 29, 103
Patoloji; 356
Portosistemik Venöz Şant; 316
Postural Denge; 242
Presbiakuzi; 152
Prevalans; 63
Prognoz; 23
Propofol İnfüzyon Sendromu; 108
Propofol; 196
Prostat; 305
Psikomotor Ajitasyon; 256
Pulmoner Arterler; 312
Pulmoner Ekinokok; 312
Pulmoner Emboli; 312
Radyoterapi; 134
Rehabilitasyon; 29, 50, 103, 423
Rotator Kaf; 234
Sağkalım; 113
Sağlık Durumu; 397
Serbest Flep; 308
Sigara Bırakma; 272
Sigara; 272
Sinovit; 305
Siprofloksasin; 426
Skuamöz Hücreli; 228
Solunum Fonksiyon Testi; 223
Spinal Anestezi; 366
Spinal Tüberküloz (Pott hastalığı); 423
Spiral Komputerize; 316
Takip; 338
Tam Kan Sayımı Parametreleri; 23
Tedavi; 103
Tedavi Sonucu; 234
Temozolomid; 134
Tırnak; 119
Tinnitus; 152
Tiroidektomi; 8
Toksikoloji; 210
Tomografi; 316
Torasik; 214
Transüretral Rezeksiyon; 366
Travma Skorlama Sistemleri; 138
Travma; 249
Trombositoz; 113
Tutumlar; 90
Ultrasonografi, Doppler; 316
Üriner İnkontinans; 324, 379
Üst Ekstremite; 50
Uygunsuz İlaç Kullanımı; 125
Uyuz; 312
Vertebra; 214
Vitamin D Eksikliği; 200
Yalnızlık; 70
Yan Etkiler; 172
Yaşam Kalitesi; 35, 379, 397
Yaşlanma; 90
Yaşlı İhmali; 99
Yaşlılar için Sağlık Servisleri/Etik; 410, 417
Yaşlılar için Sağlık Servisleri/Mevzuat ve Uygulamalar; 410, 417
Yoga; 262
Yoksulluk; 397
Zehirlenme; 210

TURKISH JOURNAL of GERIATRICS SUBJECT INDEX for 2014

Abdominal; 15
Accidental Falls; 157, 242, 410
Acidosis; 108, 196
Activities of Daily Living; 278
Adverse Effects; 172
Ageing; 90
Alzheimer Dementia; 285
Anemia; 63
Anesthesia Recovery Period; 86
Anesthesia; 86, 366, 373
Anger; 299
Anxiety; 164
Appendicitis; 345
Arthroplasty; 373
Attitudes; 90
Autopsy; 361
Basal Cell; 228
Behavior Therapy/methods; 324
Behavior; 299
Blindness; 44
Blood Cell Count; 23
Bone Fracture; 200
Breast Neoplasms; 356
Camptocormia; 103
Cancer; 164
Carboxyhemoglobin Metabolism; 223
Carcinoma; 228
Carcinoma, Non-Small-Cell Lung; 113
Cardiac Surgical Procedures; 108, 196
Cardiovascular Diseases; 15
Caregivers; 256
Chronic Obstructive/Blood; 223
Chronic Pain; 164
Ciprofloxacin; 426
Clinical Clerkship; 1
Comorbidity; 338
Consciousness Monitors; 86
Constipation; 331
Coronary Angiography; 218
Correction of Hearing Impairment; 389
Death; 361
Delirium; 57
Dementia; 143, 256, 350
Depression; 35, 70, 180
Diabetes Mellitus; 278
Diabetic Neuropathies; 312
Disability Evaluation; 44
Echinococcosis Pulmonary; 312
Echinococcosis Hepatic; 312
Education; 1
Emergency Medical Services; 57, 249
Ethics; 188
Exercise; 262, 77, 410
Fall; 138, 410
Fear; 157, 410
Fecal Incontinence; 331
Female; 324
Femoral Neuropathy; 218
Forensic Medicine; 361
Free Tissue Flaps; 308
Geriatric Assessment; 404
Glioblastoma; 134
Health Services for the Aged/Ethics; 417
Health Services for the Aged/Legislation & Jurisprudence; 417
Health Status; 397
Hearing Aid; 299
Hearing Aids; 152, 289
Hearing Loss; 205, 285, 299

Hemiplegia; 50
Hernia; 95 338
Honey; 210
Hydatidosis; 312
Hypocalcemia; 200, 426
Iliac; 214
Inguinal; 338
Inhibition; 290
Interdisciplinary Communication; 1
Iron Deficiency; 63
Ischemic Attack; 23, 210
Isoflurane; 86
Keratoderma; 321
Knee; 373, 404
Lactic; 108, 196
Legal cases; 249
Legal Guardians/Legislation & Jurisprudence; 350
Leukocyte Count; 113
Leukocytes; 345
Levobupivacaine; 366
Loneliness; 70
Low Back Pain; 214
Low; 44
Lumbar; 214
Lymphatic Metastasis; 356
Magnetic Resonance Imaging; 95, 316
Medical; 1
Melanoma; 228
Memory; 290
Mental Competency/Legislation & Jurisprudence; 350
Middle Aged; 223
Mild Cognitive Impairment; 143
Mobility Limitation; 404
Mortality; 57
Nail; 119
Neurogenic Bowel; 331
Neutrophils; 345
Nursing Homes; 262
Nursing; 379
Obesity; 15
Observation; 338
Obturator; 95
Osteitis Deformans; 205
Osteoarthritis, 404
Outcome Assessment (Health Care); 157, 404, 410
Pain; 95, 180
Palmoplantar; 321
Paraplegia; 423
Parathyroid Hormone; 8
Parkinson's Disease; 103
Patent Ductus Venosus; 316
Pathology; 356
Personal Satisfaction, 389
Physical Activity; 77
Physical Therapy Modalities; 234
Poisoning; 210
Polypharmacy; 172
Postural Balance; 157, 242, 410
Poverty; 397
Predictive Value of Tests; 138
Presbycusis; 152
Prevalence; 63
Prognosis; 23
Propofol; 108, 196
Prostate; 305
Psychomotor Agitation; 256
Pulmonary Arteries; 312
Pulmonary Disease; 223
Pulmonary Embolism; 312
Quality of Life; 35, 379, 397
Questionnaire; 143
Radiotherapy; 134
Rehabilitation; 50, 103, 423
Replacement; 373
Research; 188
Respiratory Function Tests; 223
Rotator Cuff; 234
Scabies; 312
Seizure; 200
Self Care; 278
Severity of Illness Index; 138
Skin Neoplasms; 308
Smoke; 272
Smoking Cessation; 272
Spinal; 366, 423
Squamous Cell; 228
Stroke, 23, 331
Survival Analysis; 113
Synovitis; 305
Temozolomide; 134
Thoracic; 214
Thrombocytosis; 113
Thyroidectomy; 8
Tinnitus; 152
Tobacco Smokeless; 272
Tomography Spiral Computed; 316
Toxicology; 210
Transient, 23, 210
Transurethral Resection of Prostate; 366
Treatment Outcome; 234
Treatment; 103
Tuberculosis, 423
Ultrasonography Doppler; 316
Undergraduate; 1
Upper Extremity; 50
Urinary Incontinence; 324, 379
Vertebrae; 214
Vision, 44
Vitamin D Deficiency; 8, 200
Wounds and Injuries, 249
Yoga; 262