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Dear reader of the Ege Journal of Medicine,

Life expectancy has increased with advances in healthcare. This situation has resulted in the population aged 65 and over becoming increasingly important in all over the world. Moreover, this age group has begun to acquire unique characteristics and needs as a result of aging, and this situation has created the need to evaluate this population with a different perspective.

With the population aging, geriatric medicine and other disciplines have started to give more importance to specializing in geriatrics. Prof. Dr. Sefik Kayahan has become a pioneer in the field with his studies in geriatrics at Cerrahpaşa University in Turkey. Since 1981, the department that is interested in advanced age has been called the "Division of Geriatrics" under the Department of Internal Medicine.

The first Division of Geriatrics in the Aegean region was established in 2008 within the Department of Internal Medicine at Ege University Faculty of Medicine, and the division embraces a person-centered approach with multidisciplinary teamwork. We hope that this special issue, prepared with great effort and ethical values, will be a useful resource for anyone interested in Geriatric Medicine.

Prof. Dr. Selahattin Fehmi Akçiçek

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MD. Fatma Ozge Kayhan Kocak

Guest Editors of Appendix

April 2021

İÇİNDEKİLER
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ARAŞTIRMA MAKALELERİ
RESEARCH ARTICLES

Burden, quality of life and coping strategies of palliative care patients' caregivers

Palyatif bakım hastalarının bakım verenlerinde bakım verenin yükü, başa çıkma tutumları ve yaşam kalitesinin incelenmesi

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ABSTRACT

Aim: The burden of the caregiver can affect the caregiver socially, psychologically and physically in time. Since becoming a caregiver is always an unpredictable situation adaptation to this situation takes place after the situation arises. The aim of this study is to examine the attitudes of coping with caregiver burden and quality of life in caregivers of patients hospitalized in palliative care units.

Materials and Methods: The study was carried out with caregivers of 59 hospitalized patients in the palliative care unit of a university hospital. The Zarit caregiver burden scale was used to determine the caregiver burden, the SF 36 to determine the quality of life, and the COPE self-report scales to reveal the coping attitudes.

Results: The mean score of Zarit caregiver burden scale in caregivers was 50.7 and was interpreted as a moderate burden. The highest score among the COPE subscale scores was COPE 7 (religious coping) (15.7); the lowest score is COPE 12 (4.4) (Substance use). A significant negative correlation is found between the Zarit caregiver burden scale and the education level of the caregiver (R = -0.291, p = 0.025).

Conclusion: Caregiver burden is the totality of possible physical, psychological, social or financial responses while providing care. In our country, mostly women, unemployed and low-educated family members become caregiving. In our study, the participants defined a moderate burden, although they provided care to chronic and severe patients. This indicates that in addition to the treatment of patients in palliative care centers, caregivers are also provided with medical, social and psychological support.

Keywords: Palliative care, caregiver, caregiver burden.

ÖZ

Amaç: *Bakım veren kişi üzerinde oluşan maddi ve manevi yük; zamanla bakım vereni sosyal, psikolojik ve fiziksel olarak olumsuz etkileyebilmektedir. Bakım veren haline gelme her zaman öngörülemez bir durum olduğundan bu duruma uyum, durum ortaya çıktıktan sonra gerçekleşmektedir. Bu çalışmanın amacı, palyatif bakım ünitesinde yatmakta olan hastaların bakım verenlerinde bakım verenin yükü ile başa çıkma tutumları ve yaşam kalitesinin irdelenmesidir.*

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Gereç ve Yöntem: *Çalışma bir üniversite hastanesi palyatif bakım biriminde yatmakta olan 59 hastanın bakım verenleri ile gerçekleştirilmiştir. Bakım veren yükünü belirlemek için Zarit Bakım Verenin Yükü, yaşam kalitesini belirlemek için SF 36 ve başa çıkma tutumlarını ortaya koymak için COPE öz bildirim ölçekleri kullanılmış olup ölçekler sosyal hizmet uzmanı eşliğinde doldurulmuştur.*

Bulgular: *Bakım verenlerde Zarit Bakım veren Yükü ölçeğinin ortalama puanı 50,7 olup orta düzeyde yük olarak yorumlanmıştır. COPE alt ölçek puanlarından en yüksek puan COPE 7 (Dinî olarak başa çıkma) (15,7); en düşük puan COPE 12 (4,4) (Madde kullanımı)'dır. Zarit bakım veren yükü ölçeği ile bakım verenin eğitim durumu arasında negatif yönlü anlamlı korelasyon saptanmıştır (R =-0,291, p = 0,025).*

Sonuç: *Bakım veren yükü, bakım sunarken ortaya çıkması olası fiziksel, psikolojik, sosyal veya finansal tepkiler bütünüdür. Ülkemizde bakım verme işini genellikle kadın, çalışmayan, eğitim seviyesi düşük aile bireyleri üstlenmektedir. Çalışmamızda kronik ve ağır hastalara bakım vermelerine rağmen katılımcılar orta derecede yük tanımlamışlardır. Bu durum palyatif bakım merkezlerinde hastaların tedavisinin yanı sıra bakım verenlerine de tıbbi, sosyal ve psikolojik olarak destek sunulduğunu göstermektedir.*

Anahtar Sözcükler: *Palyatif bakım, bakım veren, bakım veren yükü.*

INTRODUCTION

Palliative care is a multidisciplinary approach to increase the quality of life of people with severe disease and to prevent complications due to the disease (1). Palliative care, as defined by the World Health Organization (WHO), not only aims to maintain quality of life of patients, but also support caregivers (2). WHO predicts that palliative care units should be established to serve in all countries regardless of their level of development. In our country, the number of people receiving palliative care and palliative care units has been increasing in recent years.

Caregiving is a situation that has different dimensions for the care recipient and the caregiver. The economic and moral burden on the caregiver may negatively affect the caregiver socially, psychologically and physically over time. Burden is defined as negative subjective and objective consequences such as psychological distress, physical health problems, economic and social problems, deterioration of family relations and loosing the control. The caregiver feels obliged to provide the patient's treatment, personal care and psychosocial support (3, 4). In addition, the fear of being aware that the patient they give caregiving is approaching the end of his / her life is one of the emotions that the caregiver should deal with (5). Since becoming a caregiver is an unpredictable situation, adaptation to this situation occurs after the situation arises (6).

Determining the demographic characteristics of caregivers, especially those who give care patients with chronic diseases, may help to identify the group at risk in terms of experiencing difficulties. Thus, the coping strategies and quality of life of this group can be determined and preventive mental health services can be planned for these people. The aim of this study is to examine the strategies of coping with caregiver burden and quality of life in caregivers of hospitalized patients in palliative care units.

MATERIALS AND METHODS

Our study was conducted with the caregivers of 59 hospitalized patients in the palliative care unit of the Health Sciences University in our region between February 1, 2016 and April 30, 2016. The data were collected using face-to-face interview technique, and the data regarding the disease were obtained from the patients and the patients' file. The study was carried out by obtaining the necessary permissions from the ethics committee of the Health Sciences University Hospital in our region (ethics committee number 02-11 dated 19.01.2016). The caregivers of the patients who volunteered to participate in the study were informed and their signed consent form was obtained.

Demographic characteristics of the patients included in the study (such as age, gender, place of residence, working status, marital status, number of children), nutritional status at the time of assessment, toilet use, self-care availability, bed dependency, days of palliative care stay, geriatric syndromes (such as urinary incontinence, gaita incontinence, falls, decubitus, dementia, delirium, malnutrition, frailty) and their number has been recorded. In addition, the

demographic data of the caregiver (such as age, gender, marital status, employment status, educational status, chronic illnesses, smoking habits), psychiatric illness of the caregiver, the degree of closeness between the caregiver and the patient, the number of dependents of the caregiver and the duration of care for the patient has been recorded.

Zarit Caregiver Burden scale was used to determine caregiver burden, SF 36 to determine quality of life, and COPE self-report scale to reveal coping strategies. Scales were filled in the presence of a social services specialist.

The Zarit caregiver burden scale was developed by Zarit et al. (7) in 1980; developed to evaluate the stress experienced by the caregiver, translated to Turkish by Inci et al. (8). This highly reliable scale consists of 22 questions and is evaluated as Likert type. It is a 5-level scale scored as "0, never", "4, almost always". The minimum score which can be obtained from the scale is 0 and the maximum score is 88. Between 0-21 is evaluated as "no burden-low level", 21-40 as "mild-moderate", 41-60 as "moderate-severe", 61-88 as "severe" burden perception. The higher score represents higher burden.

The COPE scale, which evaluates coping strategies, was developed by Carver et al. (9) in 1989 and translated to Turkish by Ağargün et al (10). It consists of 60 questions with a score of 1-4 and 15 subscales (9, 10).

Each subscale consists of four questions. Each of these subscales provides information about a separate coping strategy. As a result, the higher scores to be obtained from the subscales give the possibility to comment on which coping strategy which is used more often. The subscales are:

1. Positive reinterpretation and improvement: 1, 29, 38, 59
2. Mental disengagement: 2, 16, 31, 43
3. Focus on and venting of emotions: 3, 17, 28, 46
4. Use of instrumental social support: 4, 14, 30, 45
5. Active coping: 5, 25, 47, 58
6. Denial: 6, 27, 40, 57
7. Religious coping: 7, 18, 48, 60
8. Humor: 8, 20, 36, 50
9. Behavioral disengagement: 9, 24, 37, 51
10. Restraint-coping: 10, 22, 41, 49
11. Use of emotional social support: 11, 23, 34, 52
12. Substance use: 12, 26, 35, 53
13. Acceptance: 13, 21, 44, 54
14. Suppression of competing activities: 15, 33, 42, 55
15. Planing: 19, 32, 39, 56

A 60-item form with 15 factors, each consisting of four items was created. These factors are theoretically included in three dimensions. These; problem-focused coping (4., 5., 14., 15. factor), emotion focused coping (1.7.8, 11.13 factor), dysfunctional coping (2., 3., 6., 9., 10., 12. factor).

SF-36 (Short Form 36) scale was used to determine the quality of life. Turkish validity and reliability of SF-36 was made by Koçyiğit et al. (11). SF-36 consists of two main dimensions, physical and mental, and eight subscales. Information about physical and social function, physical and emotional role restrictions, mental health, vitality, pain and general perception of health can be obtained. It can reveal the positive and negative aspects of health status. Physical function and mental health subscale scores of SF-36 were used in our study.

The SPSS-21 package program was used to record and analyze the data. Descriptive statistics were used in the evaluation of the data and the data were presented with median (minimum - maximum), number and percentage distribution. Chi-square and Mann-Whitney U tests were used to compare the data. The correlation of the Zarit Caregiver Burden Scale with other data was performed using the Spearman test. p <0.05 was considered significant.

RESULTS

The mean age of 59 patients, 32 (54.2%) female and 27 (45.8%) male, who were hospitalized in the palliative care unit, was 74.20 ± 14.22. 25 (42.4%) of the caregivers of these patients are male, 34 (57.6%) were female and the mean age was 44.10 ± 12.42. The characteristics of patients and caregivers were presented in Table-1.

Some descriptive characteristics of the patients and the scores they got from the Zarit caregiver burden scale, the subscales of the COPE scale, the SF-36 quality of life scale, and Problem-focused coping, Emotion-focused coping, and dysfunctional coping were evaluated. Statistically significant results were presented in Table-2. The mean ± standard deviation scores of the applied scales were presented in Table-3.

Table-1. Descriptive characteristics of patients and caregivers.

Characteristics	Patientn, (%)	Caregivern, (%)
Gender		
Male	32 (54.2)	25 (42.4)
Female	27 (45.8)	34 (57.6)
Age (year)	76 (20 - 102)*	44 (19 - 73)
Marital Status		
Single	14 (23.7)	32 (54.2)
Married	13 (22.0)	22 (37.3)
Other	32 (32)	5 (8.5)
Education Status		
illiterate	32 (54.2)	5 (8.5)
Literate	4 (6.8)	3 (5.1)
Primary school	18 (30.5)	34 (57.6)
Secondary school	1(1.7)	5 (8.5)
High school	4(6.8)	5 (8.5)
University	-	7 (11.9)
Working Status		
Unemployed	59 (100)	22 (37.3)
Employed	-	37 (62.7)
Living Place		
Own house	33 (55.9)	-
Childrens' house	25 (42.4)	-
Nursing Home	1 (1.7)	-
Nutritional Status		
Oral	40 (67.8)	-
Nasal	7 (11.9)	-
TPN	12 (20.3)	-
No Toilet Use	50 (84.7)	-
No Self-care	52 (88.1)	-
Bed Dependent	46 (78.0)	-
Smoking	-	17 (28.8)
Illness		5 (8.5)
Urinary Incontinence	59 (100)	-
Gaita Incontinence	34 (57.6)	-
Fall	33 (55.9)	-
Decubitis	26 (44.1)	-
Demantia	30(50.8)	-
Delirium	32 (54.2)	-
Malnutrition	28 (47.5)	-
Frailty	41 (69.5)	-
Psychiatric illness	55 (74.6)	2 (3.4)
Caregiver		
Spouse	-	5 (8.5)
Sibling	-	3 (5.1)
Child	-	37(62.7)
Father	-	2 (3.4)
Other Relative	-	11 (18.6)
Other	-	1 (1.7)
Number of Children	6 (0-12)*	-
Days in palliative care unit	7 (0-63)*	-
Number of geriatric syndromes	4 (0-5)*	-
Number of Dependents		4 (0-10)*
Caregiving Duration (months)		12 0-120)*

*Median Value (maximum-minimum); TPN, total parenteral nutrition

Table-2. Significant results between descriptive characteristics and scales.

Scales	Caregivers	Scale score Mean ± SD	p
SF-36 Physical Activity			
	Caregivers of patients with self-care	85.31 ± 21.75	**0.021**
	Caregivers of patients without self-care	60.86 ± 21.41	
	Caregivers of falling patients	74.52 ± 23.97	**0.019**
	Caregivers of patients who did not fall	45.00 ± 12.78	
	Caregivers of patients with delirium	68.19 ± 21.27	**0.025**
	Caregivers of patients without delirium	59.77 ± 21.99	
	Caregivers of frail patients	67.19 ± 22	**0.025**
	Caregivers of non-frail patients	53.71 ± 16.88	
SF-36 Mental Health			
	Caregivers of patients with fecal incontinence	51.44 ± 13.64	**0.041**
	Caregivers of patients without fecal incontinence	45.32 ± 12.64	
	Caregivers of patients with decubitus	52.37 ± 13.28	**0.019**
	Caregivers of patients without decubitus	45.0 ± 12.78	
	Caregivers of falling patients	55.93 ± 13.30	**<0.001**
	Caregivers of patients who do not fall	43.08 ± 10.71	
COPE-15 (Planinig)			
	Caregivers of bedridden patients	12.91 ± 1.99	**0.042**
	Caregivers of non-bedridden patients	11.92 ± 1.75	
COPE- 2 (Mental Disengagement)			
	Caregivers of patients with dementia	10.12 ± 1.89	**0.039**
	Caregivers of patients without dementia	9.07 ± 2.12	
COPE- 3 (Focus on and venting of emotions)			
	Caregivers of nasal feding patients	13.28 ± 2.36	
	Caregivers of oral feding patients	10.37 ± 3.33	**0.046**
	Caregivers of TPN feding patients	11.91 ± 2.87	
COPE- 4 (Use of instrumental social support)			
	Caregivers of nasal feding patients	13.57 ± 1.27	
	Caregivers of oral feding patients	11.55 ± 2.22	**0.013**
	Caregivers of TPN feding patients	13.25 ± 1.86	
COPE 11 (Use of emotional social support)			
	Caregivers of nasal feding patients	12.85 ± 3.28	
	Caregivers of oral feding patients	9.67 ± 2.96.	**0.015**
	Caregivers of TPN feding patients	11.58 ± 3.11	

SD, standart deviation; TPN, total parenteral nutrition

Table-3. Mean ± standard deviation scores of the scales.

Scales	Mean ± SD
Zarit	50.7 ± 10.7
SF-36 Physical Activity	63.7 ± 21.8
SF-36 Mental Health	48.7 ± 13.4
COPE sub-scales	
Positive reinterpretation and improvement	14.0 ± 1.6
Mental disengagement	9.6 ± 2.0
Focus on and venting of emotions	11.0 ± 3.2
Use of instrumental social support	12.1 ± 2.2
Active coping	12.1 ± 2.0
Denial	4.9 ± 2.1
Religious coping	15.7 ± 1.5
Humor	6.2 ± 2.3
Behavioral disengagement	5.7 ± 2.1
Restraint	11.1 ± 2.1
Use of emotional social support	10.4 ± 3.1
Substance use	4.4 ± 2.0
Acceptance	13.1 ± 1.9
Suppression of competing activities	10.7 ± 1.7
Planing	12.6 ± 1.9
Problem-focused coping	58.5 ± 7.2
Emotion focused coping	60.1 ± 5.7
Dysfunctional coping	35.9 ± 6.2

SD, standard deviation

Table-4. Correlations between Zarit caregiver burden scale and scores obtained from each subscale of COPE and SF-36 quality of life scale.

Scales	r	p
Positive reinterpretation and improvement	-0.005	0.969
Mental disengagement	0.321	**0.013**
Focus on and venting of emotions	0.095	0.475
Use of instrumental social support	0.215	0.103
Active coping	0.163	0.217
Denial	-0.118	0.372
Religious coping	0.052	0.694
Humor	-0.049	0.711
Behavioral disengagement	0.096	0.471
Restraint	0.244	0.063
Use of emotional social support	0.171	0.194
Substance use	0.190	0.149
Acceptance	0.276	**0.034**
Suppression of competing activities	0.044	0.743
Planing	-0.009	0.947
SF-36 Physical Activity	0.091	0.494
SF-36 Mental Health	0.033	0.803
Problem-focused coping	0.188	0.154
Emotion focused coping	0.174	0.189
Dysfunctional coping	0.203	0.123

Correlations between Zarit caregiver burden scale, and the scores obtained from each subscale of COPE and SF-36 quality of life scale were made. A statistically significant relationship was found between the Zarit caregiver burden scale and the COPE-2 and COPE-13 (mental disengagement and acceptance) subscales (r = 0.321, p = 0.013; r = 0.276, p = 0.034, respectively). Related data were presented in Table-4.

The mean score of Zarit caregiver burden scale was 50.7, and it was interpreted as a moderate burden. The mean scale score was 51.9 for females, and 49.2 for males. This difference was not statistically significant (p = 0.429). The highest score from the COPE subscale was COPE-7 (religious coping) (15.7); the lowest score is COPE-12 (4.4) (substance use). Emotional focused coping score was the highest, dysfunctional coping score was the lowest.

A weak positive correlation was found between the Zarit caregiver burden scale and the COPE-2 scale (mental disengagement) (r = 0.280; p = 0.032). Statistically significant difference was not found between the Zarit caregiver burden scale and the descriptive characteristics of the patients.

A negative significant correlation was found between the Zarit caregiver burden scale and the education level of the caregiver (r = -0.291, p = 0.025).

DISCUSSION

Since becoming a caregiver is not a chosen or planned process, it creates a physical and psychological burden on the caregiver. The caregiver who is negatively affected in emotional and social aspects also causes the person in need of care to be negatively affected (12). Caregiver burden is the whole of possible physical, psychological, social or financial reactions while caregiving (7). In the sociocultural structure of our country, it is a common behavior for family members to take care of their relatives in need. The person can perceive caregiving as his / her own duty and responsibility, as a result, the caregiver can define the burden less. In cases where the burden of caregiving is not noticed in its real dimension, the search for psychological, physical and social support that the caregiver can take from outside to eliminate or alleviate the burden may decrease, and more individual solutions such as mental disengagement and spiritual feelings may be directed.

In our country, caregiving is generally undertaken by women, and family members who are unemployed and have a low education level (13). However, this situation is not specific to Turkish population. In the study conducted by Lin et al., 63.3% of the caregivers were women (14). In our study, 57.6% of caregivers were women. This finding is consistent with the literature.

The studies have shown that female gender increases caregiver burden and decreases caregiver's quality of life (15, 16). It is a well-known fact that in addition to the compassionate, healing role and natural self-sacrifice of women, they also have a caregiving role within the scope of their traditional roles. It has been reported that women see caregiving as a continuation of their former responsibilities, and men are unfamiliar with their caregiving responsibilities (12). In a study conducted by Kim et al. (17) with 448 caregivers of cancer patients, it was shown that male caregivers perceive caregiving as a situation that supports their self-confidence, and that men experience caregiving work less stressful than women. In addition, it has been reported that the care burden perceived by women is higher than men (18, 19).

In studies in the literature, Zarit caregiving burden scale score was found to be higher in women than in men (15, 20). In our study, although the caregiving burden scale score was found to be higher in women compared to men, it did not reach a statistically significant value.

In our study, 62.7% of the caregivers were determined as the child of the patient and 8.5% as their spouse. In a study, Pang et al. (21) showed that caregivers are mostly spouses. However, studies conducted in our country have shown that caregivers are mostly the children of the patients (22-24). This may be due to the characteristics of the Turkish family structure. In our society, children are expected to provide care to their parents and live with them when needed (24). In our study, it was found that 42.4% of the patients who lived in their children's home.

In our study, the mean score of the Zarit caregiver burden questionnaire was determined as 50.7 and interpreted as moderate burden. When the patients in need of care were examined, it was found that 84.7% of the patients could not meet their toilet needs alone, 78% were bed-dependent, 88.1% could not provide self-care, 50.8% had decubitus and 54.2% had

dementia. It is expected that the burden of caregivers will be high in those who care for patients who have such a high need for care and cannot meet their daily needs on their own. Studies have also reported that caregiving burden of caregivers of dependent patients is higher than caregivers of semi-dependent or independent patients (25, 26).

However, a moderate burden was found in our study. This situation made us think that due to the nature of our society, caregivers avoid from expressing the burden, that the burden is perceived as avoiding responsibility, and therefore they feel guilt, despair, anger and fear towards them. However, we think that the palliative care services are effective in the moderate perception of burden. The burden perception of the caregiver who does not feel alone and helpless during the caregiving process decreases.

When the educational status of the caregivers was examined, it was determined that 8.5% were illiterate, 5.1% were literate and 57.6% were primary school graduates. There was a significant negative correlation between Zarit caregiver burden and education level of the caregiver. It was observed that as the educational status of the caregiver decreased, the Zarit caregiver scale score increased, in other words, the concept of burden perceived by the person increased. Studies have also found that caregivers with a low level of education have a higher burden (25, 27).

When coping strategies were examined in our study, it was found that religious coping was the most preferred and the least preferred was substance use. However, only alcohol and drugs were questioned as substance use, smoking was not questioned. Paying attention to religious values in the region where our study was conducted may cause the religious coping to be preferred more. A person who has been brought up with the teachings of praying throughout her / his life, taking shelter in God, and thinking that she/he is with God when feeling helpless, tries to overcome caregiver burden with religious coping as she / he knows best. In addition, this situation is not only eligible for our region. Studies have also shown that caregivers reduce their caregiving burden with belief and fate perception (28). The fact that substance use is not preferred as a coping strategy may be related to the perception of this behavior as a sin in our society.

The quality of life of the patient in need of care is closely related to the quality of life of the caregiver (29, 30). In palliative care units, psychosocial needs of caregivers are met in addition to the care of patients. This situation is very important and beneficial in adapting to the caregiver role (31).

In our study, situations requiring different care were examined in the same study. This is the limitation of our study. However, our study contributes to the literature in order to turn care responsibility into the concept of burden and to examine coping strategies.

CONCLUSION

As a result, it is very important for the caregiver to know the difficulties they will face, to develop strategies to cope with them, and to access social support when needed. Palliative care units, where caregivers can access social and professional support, increase quality of life of caregivers and consequently the quality of life of the patients by reducing the care burden.

Conflict of Interest: The authors declared no conflict of interest.

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The effect of physical activity on sleep quality in the older adults in nursing homes

Huzurevlerinde yaşayan yaşlı bireylerde fiziksel aktivitenin uyku kalitesi üzerine etkisi

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ABSTRACT

Aim: The aim of this study was to determine the relationship between physical activity and sleep quality in older adults living in nursing homes.

Materials and Methods: The study involved 456 elderly participants who were living in the nursing homes. Their demographics were noted with the face-to-face interview method. The levels of daytime sleepiness (Epworth Sleepiness Scale), physical activity (International Physical Activity Questionnaire) and sleep quality (Pittsburgh Sleep Quality Index) of the older adults were evaluated.

Results: The individuals were scored and grouped based on their levels of physical activity. No significant differences were observed between the groups in terms of sleep quality ($p = 0.41$). However, a statistically significant difference was observed between the groups in terms of daytime sleepiness ($p < 0.001$). A statistically significant, poor relationship was identified in the negative direction between the level of physical activity and daytime sleepiness ($r = -0.16$, $p = 0.03$). A statistically significant, poor relationship was observed in the negative direction between the level of sleep quality and daytime sleepiness ($r = 0.20$, $p < 0,001$).

Conclusion: In the older adults, daytime sleepiness is associated with the levels of physical activity. Additionally, there are no relations between the sleep quality and level of physical activity. Daytime sleepiness is listed as one of the reasons of low physical activity levels in the older adults. Daytime sleepiness should also be inquired for the assessment of physical activities.

Keywords: Aged, physical activity, sleep, nursing homes.

ÖZ

Amaç: Bu çalışmanın amacı, huzurevinde yaşayan 65 yaş ve üzeri yaşlı bireylerin fiziksel aktivite ile uyku kaliteleri arasındaki ilişkiyi değerlendirmektir.

Gereç ve Yöntem: Çalışmaya huzurevlerinde yaşayan toplam 456 yaşlı birey dahil edildi. Karşılıklı görüşme yöntemiyle demografik bilgileri kaydedildi. Yaşlıların gündüz uykululuğu (Epworth Uykululuk Skalası), fiziksel aktivite düzeyi (International Physical Activity Questionnaire) ve uyku kalitesi (Pittsburgh Uyku Kalitesi İndeksi) değerlendirildi.

Bulgular: Bireyler fiziksel aktivite düzeyine göre puanlanarak gruplandırıldı. Uyku kalitesi açısından gruplar arasında anlamlı fark görülmemiştir (p = 0,41). Gündüz uykululuğu açısından ise gruplar arasında istatistiksel olarak anlamlı fark saptanmıştır (p <0,001).

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Fiziksel aktivite düzeyi ile gündüz uykululuğu arasında istatistiksel açıdan negatif yönde, zayıf, anlamlı bir ilişki olduğu saptanmıştır (r = -0,16, p = 0,03). Uyku kalitesi ile gündüz uykululuğu arasında istatistiksel açıdan negatif yönde, zayıf, anlamlı bir ilişki olduğu saptanmıştır (r = 0,20, p <0.001).

Sonuç: *Yaşlı bireylerde gündüz uykululuğu bireylerin fiziksel aktivite düzeyi ile ilişkilidir. Bununla birlikte uyku kalitesi ile fiziksel aktivite düzeyi arasında ilişki yoktur. Gündüz uykululuğu yaşlı bireylerde düşük fiziksel aktivite düzeyi nedenleri arasındadır. Fiziksel aktivite değerlendirmelerinde gündüz uykululuğunun da sorgulanması gerekmektedir.*

Anahtar Sözcükler: *Yaşlı, egzersiz, uyku, bakımevleri.*

INTRODUCTION

The elderly population in Turkey is gradually increasing just like the trend observed around the world. With the increase in average life-expectancy, old age-related diseases are increasing in prevalence. As known, at old ages, people retire, draw away from the social life and daily chores, and move less. However, leading a physically active life is even more critical in this period, just like it is in all age groups. It is clear that physical activity is important in preventing chronic diseases and premature death (1). Exercise is important in the improvement and development of both the physical and emotional well-being of individuals (2). Physical activity is defined as all physical movements resulting in energy consumption (daily activities such as housework, cleaning etc.) (3). Today factors such as the pace of urbanization, overpopulation, increasing poverty, rising crime rates, density of traffic, air pollution, inadequacy of parks, walking paths, exercise and resting areas have a negative impact on the levels of physical activity of individuals (4). The relationship between physical activity and sleep quality has been investigated in many studies. Although studies report the positive influence of physical activity and exercise on sleep quality, there are also studies that do not support this hypothesis (5, 6).

Sleep disorders are among the most significant problems affecting the older adults. The sleep quality of the older adults has become the area of focus for many researchers in the past years. The studies carried out show that many factors may affect sleep quality (6). Physical activity is a factor that contributes to the well-being of the older adults, is a necessity for the quality of life and prevents many chronic diseases (7). It was observed that physical activity and exercise were related to higher quality sleep and less sleep disorders in healthy adults. Poor sleep quality and abnormal sleep durations (over or under 7-8 hours a day) were identified as being associated with morbidity and mortality (8). It was seen that exercising for more than one hour a day is associated with a longer duration of sleep and that low-intensity exercises had a positive influence on sleep (8). The sleep disorders in the older adults are related to an inactive lifestyle. It was seen that older adults, who exercise regularly, have higher quality sleep and experience less sleep-related problems (5-7). In the literature, there are a few studies that investigate the relationship between physical activity and sleep. In Turkey, different studies have been conducted for determining the levels of physical activity and sleep quality; however the correlation between these two parameters is yet to be clarified. Thus, this study was carried out in order to determine whether the level of physical activity is related to sleep quality.

MATERIALS AND METHODS

Study Population

The study was conducted in four nursing homes located within the borders of İstanbul between March 2018 and April 2019. The cross-sectional and prospective study involved 456 elderly participants (204 female and 252 males) in nursing homes.

Participants who scored 23 or lower from the Standardized Mini-Mental State Examination; who use orthotic or prosthetic aids; who were diagnosed with a sleeping disorder; who have neurological, musculoskeletal or cardiopulmonary diseases; who are younger than 65 years and have had a history of operations, fractures and trauma in the past six months; who have uncontrolled hypertension; who have obesity or are recovering from an acute illness were excluded from the study. Standardized Mini Mental State Examination scores and personal backgrounds of the individuals were collected from their files. As the individuals were being divided into the groups, gender, age and body mass index were among the variables taken into consideration.

Assessment of sleep quality

Pittsburgh Sleep Quality Index (PSQI) was used to assess the sleep quality. PSQI was developed by Buysse et al. in 1989 (9). Validity and Reliability studies were carried out by Ağargün et al. (10). PSQI provides a reliable, valid and standard measurement of sleep quality. The scale consists of 24 questions in total. The total score is between 0 – 21. The level of quality is classified as good sleep quality (0 – 4 points) and poor sleep quality (5 – 21 points) (9).

Assessment of physical activity levels

For the assessment of physical activity levels, the International Physical Activity Questionnaire (IPAQ) was used. IPAQ is a community-based questionnaire that allows the duration of different levels of physical activity for the past week. There are four sections in the questionnaire (high intensity physical activity, medium intensity physical activity, walking and sitting down). The data in the assessment are analysed by being translated into metabolic equivalent (MET) values (11).

IPAQ Continuous Score

Expressed as MET-min per week: MET level x minutes of activity x events per week

Total MET-min/week = (Walking METs*minute*days) + (Moderate intensity METs*minute*days) + Vigorous intensity METs*minute*days)

Physical activity levels are classified as physically inactive (<600 MET - min/week), low levels of physical activity (minimally active) (600 – 3000 MET - min/week) and a healthy level of physical activity (very active) (>3000 MET - min/week) (11-14).

Assessment of daytime sleepiness

Epworth Sleepiness Scale (ESS) was used for the assessment of daytime sleepiness. ESS is a scale that quantifies the level of sleepiness experienced by the individual during their daily activities. An individual may get a score from 0 to 24. Individuals with a score of 10 or more are deemed to have "increased daytime sleepiness" (15, 16). Validity and reliability studies were performed on the Turkish version (17).

Statistical analysis

The mean and standard deviation of the data measured were calculated, the ones determined by census were indicated in numbers and percentages. Variance analysis (ANOVA) was used for the comparison of IPAQ, PSQI and ESS scores and Pearson Correlation Analysis for investigating the relationship between sleep quality and daytime sleepiness. After the measurements are divided into groups, Bonferroni correction was used to determine which group is the cause of the difference. The confidence interval was assumed to be 95% and probability of error as $p < 0.05$.

RESULTS

The study involved 456 elderly participants (252 females and 204 males). The mean age of the elderly people interviewed was 78.29 ± 6.51. Of them, 55.3% were female. The mean body mass index (BMI) of the elderly participants was 25.26 ± 3.04, kg/m^2. There was no statistically significant difference between physical activity level and gender, age, body mass index and sleep quality. However, a statistically significant difference was found between physical activity level and daytime sleepiness. (p = 0.04) (Table-1).

Mean PSQI score and mean sleep duration per night according to the characteristics and lifestyles of the participants were shown in Table-2. However, no statistically significant differences were observed between the groups in terms of PSQI scores (p >0.05). There were no statistically significant differences between ESS scores and gender, age, body mass index and sleep quality (p >0.05). When the individuals were grouped in accordance with their levels of physical activity, a statistically significant difference was observed between the groups in terms of ESS scores (p = 0.01) (Table-3).

When the individuals were grouped in accordance with their IPAQ scores, no significant differences were observed between the groups in terms of sleep quality (p = 0.41). However, when the groups were compared in terms of daytime sleepiness, a statistically significant difference was observed between the groups (p <0.0001) (Table-4). When the Bonferroni correction is carried out to determine which group is the cause of the variance between levels of physical activity and daytime sleepiness of the individuals, it was seen that this difference was between the minimally active and very active groups (p = 0.01). It was also determined that the mean ESS score of the minimally active group was significantly higher than the mean ESS score of the very active group (95% Confidence interval = 0.58 - 4.42) (Table-5).

Table-1. Total IPAQ scores and duration of sitting down of the participants.

Characteristics	n	Total IPAQ score Mean ± SD	p	Duration of sitting down[**] Mean ± SD	p
Gender					0.59
Female	252	1867.1 ± 1605.9	0.39	7.1 ± 2.7	
Male	204	2129.8 ± 3247.8		6.9 ± 1.2	
Age group, years					0.59
65-74	124	2445.1 ± 3769.1	0.19	7.1 ± 2.9	
75-84	256	1831.1 ± 1765.4		7.0 ± 3.1	
≥85	76	1756.3 ± 1720.2		7.2 ± 2.8	
BMI, kg/m^2					0.69
≥25	256	1931.4 ± 2841.6	0.71	6.6 ± 3.1	
<25	200	2061.4 ± 1920.1		6.5 ± 2.9	
Daytime sleepiness					0.21
No	106	2159.4 ± 2721.3	**0.03***	6.4 ± 3.1	
Yes	350	1401.2 ± 1269.5		7.1 ± 3.2	
Sleep quality					0.52
Poor	220	2029.9 ± 3069.5	0.78	7.1 ± 3.1	
Good	236			6.6 ± 3.2	

BMI, Body mass index; *p <0.05; ** hours/day; IPAQ, International physical activity questionnaire, SD, standard deviation.

Table-2. PSQI scores and sleep duration per night of the participants.

Characteristics	n	PSQI score Mean ± SD	p	Sleep duration per night* Mean ± SD	p
Gender			0.08		0.39
Female	252	5.6 ± 3.6		7.1 ± 1.5	
Male	204	5.1 ± 3.4		6.9 ± 1.7	
Age group, years			0.19		0.51
65-74	124	6.1 ± 4.1		6.9 ± 1.4	
75-84	256	5.1 ± 4.2		7.0 ± 1.6	
≥85	76	5.3 ± 3.4		7.4 ± 1.8	
BMI, kg/m^2			0.41		0.41
≥25	256	5.4 ± 3.6		6.9 ± 1.6	
<25	200	5.1 ± 3.5		7.3 ± 1.8	
Daytime sleepiness			0.07		0.61
No	106	6.1 ± 3.9		6.9 ± 1.7	
Yes	350	5.1 ± 2.9		6.8 ± 1.8	
Level of physical activity			0.41		0.61
Inactive	92	6.2 ± 4.1		6.8 ± 1.8	
Minimally active	286	5.1 ± 4.2		6.4 ± 1.6	
Very active	78	4.9 ± 2.9		6.5 ± 1.3	

*hours/day; BMI, Body mass index; PSQI, Pittsburgh Sleep Quality Index; SD, standard deviation.

Table-3. ESS scores of the participants.

Characteristics	n	ESS score Mean ± SD	p
Gender			0.19
Female	252	7.13 ± 4.96	
Male	204	6.43 ± 4.01	
Age group, years			0.91
65-74	124	7.12 ± 5.13	
75-84	256	7.17 ± 5.63	
≥85	76	7.44 ± 5.02	
BMI, kg/m^2			0.07
≥25	256	7.46 ± 5.26	
<25	200	6.12 ± 4.61	
Level of physical activity			**0.01**[*]
Inactive	92	7.16 ± 5.13	
Minimally active	286	7.29 ± 5.09	
Very active	78	6.21 ± 4.87	
Sleep Quality			0.07
Poor	200	7.14 ± 5.18	
Good	256	6.82 ± 5.09	

*p<0.05; ESS, Epworth Sleepiness Scale; SD, standard deviation; BMI, Body mass index.

Table-4. Comparison of IPAQ scores with sleep quality and daytime sleepiness.

Source of the variance	Sum of squares	Degree of freedom	Mean of squares	D	P*
Daytime sleepiness	206.36	2	112.64	6.64	**0.01**[**]
Sleep quality	24.48	2	14.96	1.24	0.41

*For ANOVA; p <0.05; **Statistical difference between groups; IPAQ, International physical activity questionnaire.

Table-5. Investigation of the difference between level of physical activity and daytime sleepiness.

	Average difference ± SD	p*	95% confidence interval
Inactive			
Minimally active	-0.19 ± 0.81	1.00	-1.96 - 1.64
Very active	2.31 ± 0.89	0.07	-0.06 - 4.61
Minimally active			
Inactive	0.18 ± 0.82	1.00	-1.64 - 1.96
Very active	2.46 ± 0.78	**0.02**[**]	0.62 - 4.38
Very active			
Inactive	-2.32 ± 0.88	0.07	-4.63 - (-0.62)
Minimally active	-2.48 ± 0.78	**0.02**[**]	

*For Bonferroni correction; p <0.0167; **Statistical difference between groups, SD, standard deviation.

A significant correlation was not observed between the physical activity level scores and sleep quality scores of the individuals (r = -0.28, p = 0.72). A statistically significant, poor relationship was identified in the negative direction between the physical activity and daytime sleepiness scores (r = -0.16, p = 0.03). A statistically significant, poor relationship was observed in the positive direction between the parameters when sleep quality and daytime sleepiness scores were examined (r = 0.18, p < 0.0001).

DISCUSSION

Physical activity is defined as all kinds of bodily motion causing the skeletal muscles to contract and the energy consumption to increase significantly. Physical activity does not require supervision and is performed at a lower intensity than exercise (3). It is known that physical activity both helps in controlling the body weight and by other mechanisms, decreases the risk of developing chronic diseases. It was reported that physical activities have a positive impact on balance, endurance, sleep, social life, emotional state and mental functions of the older adults (18).

In the study carried out by Lee et al. (19) on 216 individuals, it was determined that the total IPAQ scores of males were higher than the scores of females. In another study conducted by Deng et al. (20) on 224 individuals with a mean age of 65 years and above, the physical activity level of males was shown to be lower than females, but no significant differences were observed between two groups. This was attributed to the fact that statistically mean age of females was lower than males. Our result is in accordance with Lee et al.'s study, the total IPAQ scores of males were higher than the scores of females, although not at a significant level. The reason for this may be that women living in a nursing home in our country are less physically active, as they go out less than men.

Sleep quality and daytime sleepiness are important parameters affecting the sleep and wakefulness function. The process of ageing causes many changes on sleeping patterns. The increase observed in sleep-related problems by age affects the quality of life in the older adults. Nevertheless, depending on poor quality of life, sleep-related problems constitute a risk factor, especially in the older adults, and there is a strong connection between sleep-related problems and premature death (7).

Another parameter affecting the quality of life in the older adults is exercise. The influence of exercise on sleep has been investigated for many years. The studies on this subject matter are contradictory (21). Twenty-nine studies concluded that exercise had a positive effect on sleep quality or duration; however, four found no difference, and one reported that exercise had a negative effect on sleep. It was reported that this could be attributed to the methodological differences between studies, the difference in the physical activity levels of the individuals, limited number of individuals being placed in the control group of some studies or lack of control groups and individuals mainly with a good sleeping pattern being enrolled in the studies (21). In our study, no significant correlation was observed between the physical activity levels and sleep quality of the individuals. We believe that this result is attributable to the fact that more active older adults in the institution participated in the study and physical activity level and sleep quality were measured subjectively.

In the study carried out by Willette-Murphy et al. (22) on 68 individuals with a mean age of 64.15, PSQI score of the physically active group was measured as 6.0 ± 3.9 and inactive group as 5.8 ± 3.0; and concluded that the difference was not statistically different. In our study, PSQI score of the very active group was shown to be 5.1 ± 3.0 and inactive group 5.8 ± 3.4, and these two scores were similar.

In the study carried out by Watson et al. (23) on 3403 individuals the average PSQI score was measured as 4.9 ± 2.6. The result obtained with our study are similar to the results found in the literature.

In the study carried out by Fatima et al. (24) in a nursing home included 400 individuals over the age of 60, and it was determined that 82.6% of the individuals had poor sleep quality and 29.2% had excessive daytime sleepiness. However, in our study, 48.2% of the individuals had poor sleep quality and 76.8% excessive daytime sleepiness. When the sleep quality scores and daytime sleepiness scores of the individuals were examined, a statistically significant, poor relationship was identified in the negative direction between the parameters. With this result, it was concluded that an increase in sleep quality may cause a decrease in daytime sleepiness.

In the study carried out by He et al. (25) daytime sleepiness of 26 older adults was measured. In this study utilizing ESS, a significant difference was observed between the daytime sleepiness of the physically active and inactive older adults, and it was identified that the older adults with a higher level of physical activity had a lower ESS score as compared to the ones with lower levels of physical activity.

In the study carried out by Baron et al. (26), it was indicated that 85% of the individuals with low levels of physical activity experienced daytime sleepiness, whereas 72% of the individuals with high levels of physical activity did not. A correlation between daytime sleepiness and low levels of physical activity was observed. In our study, the mean ESS score of the minimally active group was significantly higher than the very active group (p = 0.01). It was also determined that the mean ESS score of the minimally active group was significantly higher than the mean ESS score of the very active group (95% Confidence interval = 0.58 - 4.42)

CONCLUSION

In conclusion, with the determination of the relationship among physical activity level, daytime sleepiness and sleep quality, studies should be planned to increase the physical activity level of older adults in nursing homes. In this way, it is thought that older adults can be protected from daytime sleepiness and their sleep quality can be increased.

It should also be noted that daytime sleepiness may be one of the reasons of low physical activity levels in older adults. Therefore, daytime sleepiness should be questioned in the assessment of physical activity level of the elderly. More studies are needed on this subject. It is believed that this study will provide insight to future studies.

Ethical standards

The research protocol was approved by the local ethics committee on February 12, 2020 (Approval Number: 54022451-050.05.04-1993). Each participant was informed about the study and signed a consent form.

Conflict of interest

The authors declare that they have no conflict of interest.

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Potentially inappropriate medication usage, fall and comorbidities in geriatric patients diagnosed with chronic subdural hematoma

Kronik subdural hematom tanılı geriatrik hastalarda potansiyel uygunsuz ilaç kullanımı, düşme ve komorbiditeler

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ABSTRACT

Aim: The annual incidence of chronic subdural hematoma is 2-4/100000 in geriatric population. We aimed to investigate relationship between potentially inappropriate medication usage according to Beers 2019 criteria, fall and Charlson comorbidity index in geriatric patients diagnosed with chronic subdural hematoma.

Materials and Methods: We retrospectively collected medical records of 69 geriatric patients diagnosed with chronic subdural hematoma and hospitalized for the last 5 years in neurosurgery department of Izmir Katip Çelebi University Hospital with the permission of local ethical committee of medical faculty. Data was recorded and analyzed with appropriate method by using SPSS v18.

Results: Mean age was 78.43 ± 7.51 years, mean Charlson comorbidity index was 5.87 ± 2.97. Falling events were responsible for 59 (85.5%) out of 69 chronic subdural hematoma cases. Potentially inappropriate medication usage according to Beers 2019 criteria was found in 20 (29%) patients. Inappropriate medications belonged to cardiovascular system (14.5%) class and antiplatelet/anticoagulant (14.5%) class mostly. When group was divided into two groups as patients who used potentially inappropriate medication or not, Charlson comorbidity index was found to be higher in the first group. (p <0.05) When group was divided into two groups as patients who fall or not, no correlation was found in Charlson comorbidity index, dementia prevalence, hospitalization duration, number of medications, potentially inappropriate medication, cerebrovascular infarct and hemiplegia prevalence between these groups (p >0.05). Charlson comorbidity index and number of medications showed significant correlation (p = 0.001).

Conclusion: We could not reach a significant correlation between fall, Charlson comorbidity index and potentially inappropriate medication usage in our retrospective study. Small study population size, unreliable medical records and relatively healthy characteristics of population may contribute to crossing results.

Keywords: Chronic subdural hematoma, geriatrics, fall, comorbidity, inappropriate medication, Beers criteria.

ÖZ

Amaç: Kronik subdural hematom insidansı, geriatrik yaş grubunda yılda 2-4/100000'dir. Kronik subdural hematom tanılı geriatrik hastalarda, Beers 2019 kriterlerine göre potansiyel uygunsuz ilaç kullanımı ile düşme ve Charlson komorbidite indeksi arasındaki ilişkiyi araştırmayı amaçladık.

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Gereç ve Yöntem: *İzmir Katip Çelebi Üniversitesi Hastanesi Beyin ve Sinir Cerrahisi bölümünde son 5 yılda kronik subdural hematom tanısıyla yatan 69 hastanın tıbbi kayıtları yerel fakülte etik kurulunun izniyle retrospektif olarak toplandı. Veriler uygun istatistiksel yöntem kullanılarak SPSSv18 programıyla analiz edildi.*

Bulgular: *Hastaların yaş ortalaması 78,43 ± 7,51 yıl, ortalama Charlson komorbidite indeksi 5,87 ± 2,97 puandı. Düşme olayları 69 kronik subdural hematom vakasının 59'undan (%85,5) sorumluydu. Beers 2019 kriterlerine göre potansiyel uygunsuz ilaç kullanımı 20 hastada (%29) saptandı. Uygunsuz ilaçlar en çok kardiyovasküler sistem sınıfı (%14,5) ve antitrombosit / antikoagulan sınıfa (%14,5) aitti. Hastalar potansiyel uygunsuz ilaç kullanımının olup olmamasına göre iki gruba ayrıldığında, Charlson komorbidite indeksi ilk grupta daha yüksek saptandı (p <0,05). Hastalar düşen ve düşmeyenler olarak iki gruba ayrıldığında, Charlson komorbidite indeksi, demans prevalansı, hastanede yatış süresi, ilaç sayısı, potansiyel uygunsuz ilaç kullanımı, serebrovasküler infarkt ve hemipleji varlığı her iki grupta istatistiksel olarak farklı saptanmadı (p >0,05). Charlson komorbidite indeksi ve kullanılan ilaç sayısı arasında önemli istatistiksel ilişki saptandı (p = 0,001).*

Sonuç: *Retrospektif çalışmamızda düşme, Charlson komorbidite indeksi ve potansiyel uygunsuz ilaç kullanımı arasında önemli bir ilişki saptayamadık. Küçük çalışma grubu, retrospektif kayıtların güvenilmez oluşu, çalışma popülasyonun görece sağlıklı karakteristiğe sahip oluşu kafa karıştırıcı sonuçlara katkıda bulunmuş olabilir.*

Anahtar Sözcükler: *Kronik subdural hematom, geriatri, düşme, komorbidite, uygunsuz ilaç, Beers kriterleri.*

INTRODUCTION

Chronic subdural hematoma (CSH) which is caused by either mild trauma or falling is a frequent neurosurgical diagnosis with a global incidence of 2-4 in 100000 per year in elderly people. Aging population, extensive and inappropriate use of antiplatelets or anticoagulants, increasing number of frail elderlies who are at risk for falling and increasing comorbidities with age contribute to raise the incidence of CSH (1).

Charlson comorbidity index (CCI) was first described in 1987 and started to be used by clinicians to calculate predicted 10-year survival of patients. This calculation demands some information such as age, comorbidities, malignant tumors, hemiplegia etc. As total score increases, survival expectancy lowers (2).

Falling is a geriatric syndrome which causes mortality and morbidity in patients over 65 years old. Complications caused by falling includes femoral neck fracture, vertebrae fracture, operation related complications, venous thrombosis and immobility (3).

Falls were found to be associated with potentially inappropriate medication usage in elderly. Beers 2019 Criteria provided a wide view of probably harmful medications in geriatric population. Extensive and unnecessary use of antiplatelets and anticoagulants, hypnotic and sedative use in patients at risk for falling and antihypertensive overuse in patients at risk for falling are the leading causes for geriatric patients to increase falls (3-5).

We aimed to investigate relationship between potentially inappropriate medication usage according to Beers 2019 criteria, falls and CCI in geriatric patients diagnosed with CSH.

MATERIAL AND METHOD

We retrospectively collected medical records of 69 geriatric patients diagnosed with CSH and hospitalized for the last 5 years in neurosurgery department of Izmir Katip Çelebi University Hospital with the permission of local ethical committee of medical faculty. CSH cases caused by high energy traumas, cases aged below 64 years, cases without available previous medication and comorbidity history were excluded. Patients aged over 64 years and more, diagnosed with CSH because of low energy traumas were included. Data was recorded to SPSS v18.0. Descriptive analyzes were done. Parametric variables were expressed as mean ± standard deviation. The groups of parametric variables were compared using the Student's t test and analysis of variance. Also, the groups of nonparametric variables were compared using the Mann– Whitney U test. A value of $p <0.05$ was accepted as statistically significant.

RESULTS

Mean age was 78.43 ± 7.51 years, mean Charlson comorbidity index was 5.87 ± 2.97. The most common comorbidities were hypertension in 37 (53.6%), diabetes mellitus in 16 (23.2%) and heart failure in 16 (23.2%) patients. Falling events were responsible for 59 (85.5%) out of 69 CSH cases. Potentially inappropriate medication usage according to Beers 2019 criteria was found in 20 (29%) patients. Inappropriate medications belonged to cardiovascular system 10 (14.5%) class and antiplatelet/anticoagulant 10 (14.5%) class mostly. When group was divided into two groups as patients who used potentially inappropriate medication or not, CCI was found to be higher in the first group (p <0.001). Age, falling prevalence, dementia prevalence, hospitalization duration did not differ much among these groups. When group was divided into two groups as patients who fall or not, no correlation was found in CCI, dementia prevalence, hospitalization duration, number of medications, potentially inappropriate medication, cerebrovascular infarct and hemiplegia prevalence between these groups. CCI and number of medications and CCI and potentially inappropriate medication usage showed significant correlation (p = 0.001), (Table-1).

Table-1. Descriptive of study population.

Variable	n, % or mean ± SD
Age (years)	78.43 ± 7.51
Sex	
Male n, (%)	58 (84.1)
Female n, (%)	11 (15.9)
Hospitalization duration (days)	5.90 ± 2.55
CCI	5.87 ± 2.57
Number of Medication	1.99 ± 2.53
Mortality	0
CSH cause: trauma/fall	10 (%14.5) / 59 (%85.5)
Potentially inappropriate medication	20 (%29)
	cardiovascular system: 10 (%14.5) antiplatelets:/anticoagulants: 10 (%14.5)
	Benzodiazepines in patients at risk for falling: 1 (%1.4)
	Anti-hypertensives in patients at risk for falling: 2 (%2.9)
Comorbidities	
Diabetes mellitus	16 (%23.2)
Hypertension	37 (%53.6)
Heart failure	16 (%23.2)
Myocardial infarction	5 (%7.2)
Cerebrovascular infarction	19 (%27.5)
Malignant tumor	8 (%11.6)
Dementia	10 (%14.5)
Renal failure	11 (%15.9)

SD, standard deviation; CCI, Charlson Comorbidity Index; CSH, chronic subdural hematoma

DISCUSSION

Falls, comorbidities and inappropriate medication usage are major issues in geriatric population which reaches over 8 million people in Turkey in 2019. These issues often accompany each other and each of them increases the risk of CSH occurrence with low energy traumas in elderly (6, 7). CSH is the most frequent diagnosis in neurosurgery inpatients. CSH causes morbidity and mortality in affected individuals (8). Thus, prevention of CSH may be a better aim than to treat.

Beers 2019 criteria listed potentially inappropriate medication in certain diagnosis for elderly people clearly (9). Previous criteria seem to be updated with the new version and provides answers for unknown issues. Potentially inappropriate medication usage: especially as unnecessary antiplatelet/anticoagulant use, unnecessary sedative/hypnotic use in patients at risk for falling, unnecessary anti-hypertensive use in patients at risk for falling may cause balance problems, postural hypotension, eventually falling and easy bleeding with low energy traumas (10, 11). Thus, CSH occurrence may be prevented if relationship between these issues is proved.

We tried to evaluate relationship between potentially inappropriate medication, fall and CCI in 69 geriatric patients diagnosed with CSH. We detected a correlation between high CCI, number of medications and potentially inappropriate medication usage. Age, falling prevalence, dementia prevalence, hospitalization duration did not differ much by potentially inappropriate medication usage. Falling was not found correlated with dementia prevalence, hospitalization duration, number of medications, potentially inappropriate medication, cerebrovascular infarct and hemiplegia prevalence.

Although there are contrary examples, some of the previous literature suggested that extensive antiplatelet/anticoagulant usage is associated with increased risk of CSH (12-17). We detected that 10 patients with CSH (14.5%) were on inappropriate antiplatelet/anticoagulant therapy in our study. Although our study design did not allow us to analyze additional risk caused by this issue, 14.5% of the CSH cases might have been avoided with paying attention. In general, we detected 29% potentially inappropriate medication usage in study population. It is not easy to define whether this situation caused balance problems, postural hypotension and caused falling or not with our study design. However, we ensure that they all contributed.

Frailty is a geriatric syndrome which defines a clinical situation of reduced endurance to stressors. In aging population, comorbidities are major causes of frailty (18). We tried to evaluate comorbidity burden in CSH patients with CCI calculation of each patient. We found a mean CCI of 5.87 ± 2.57 points and significant correlation with number of medications and potentially inappropriate medication usage. It is natural for a person to need more drugs with increasing comorbidities. The important point is that patients should avoid unnecessary medicine and avoid treating side effects of one drug with another which is called as prescription cascade. Geriatricians should follow up drug history of patients in the light of current literature and guidelines.

CONCLUSION

We did not find a correlation between potentially inappropriate medication, falls and CCI in geriatric CSH patients. On the other hand, we detected a correlation between CCI, number of medications and potentially inappropriate medication usage. Potentially inappropriate medication, hospitalization duration, age, sex did not differ much in patients with or without falling event. Limitations of our study are being retrospective, having not a control group and small study population size. This subject needs to be enlighten with large controlled prospective clinical trials.

Conflict of interest: None declared.

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Endoscopic findings in the older patients with iron-deficiency anemia

Demir eksikliği anemisi olan yaşlı hastalarda endoskopik bulguların değerlendirilmesi

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ABSTRACT

Aim: The presence of iron-deficiency anemia, which is an important indication for endoscopic procedures, in the geriatric population necessitates the exclusion of a possible malignancy in the gastrointestinal system. This study aims to examine endoscopic findings in geriatric patients that underwent esophagogastroduodenoscopy and colonoscopy because of iron-deficiency anemia.

Materials and Methods: Sixty patients aged 65 and over who underwent esophagogastroduodenoscopy and colonoscopy because of iron-deficiency anemia between August 2019 and August 2020 were retrospectively evaluated. Age, sex, geriatric age groups of patients, presence of *Helicobacter pylori* in gastric biopsy, esophagogastroduodenoscopy findings, colonoscopy findings, presence of internal and / or external hemorrhoids, and duodenal biopsy results were examined.

Results: Thirty (50%) of 60 patients included in the study were male and the mean age was 72.47 ± 6.07 years. Of these patients, 41 (68.4%) were young-old, 17 (28.3%) were middle-old and 2 (3.3%) were old-old. The most common causes that might explain iron-deficiency anemia in esophagogastroduodenoscopy were atrophic gastritis (21.2%), *Helicobacter pylori*-positive gastritis (20%), gastric polyp (11.7%), and gastric cancer (3.3%), whereas colonoscopy results were found colon polyps in 23.3% of patients, diverticulum in 15% and angiodysplasia in 15%, and colon cancer in 8.3%. Internal hemorrhoids were also observed in 44 (73.3%) patients.

Conclusion: In the older population, blood loss from the gastrointestinal system is the most important cause of iron-deficiency anemia and just hemorrhoids cannot explain IDA. While examining the etiology of patients diagnosed with iron-deficiency anemia, performing both esophagogastroduodenoscopy and colonoscopy is an accurate approach to reach the underlying cause and not to miss a possible malignancy.

Keywords: Iron-deficiency anemia, older patient, endoscopy, colonoscopy.

ÖZ

Amaç: Endoskopik işlemler için önemli bir endikasyon olan demir eksikliği anemisinin geriatrik popülasyonda varlığı, gastrointestinal sistemde olası bir maligniteyi dışlamayı gerektirmektedir. Bu çalışmada amaç demir eksikliği anemisi nedeni ile özofagogastroduodenoskopi ve kolonoskopi yapılan geriatrik popülasyonda endoskopik bulguların incelenmesidir.

Gereç ve Yöntem: Ağustos 2019-Ağustos 2020 tarihleri arasında demir eksikliği anemisi nedeni ile özofagogastroduodenoskopi ve kolonoskopi yapılan 65 yaş ve üzeri 60 olgu retrospektif olarak değerlendirilmiştir.

Hastaların yaş, cinsiyet, geriatrik yaş grupları, alınan mide biyopsisinde Helicobacter pylori varlığı, özofagoduodenoskopi bulguları, kolonoskopi bulguları, internal ve/veya eksternal hemoroid varlığı, duodenum biyopsisi sonuçları incelenmiştir.

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Bulgular: Çalışmaya dahil edilen 60 hastanın 30'u (%50) erkekti ve yaş ortalaması 72,47 ± 6,07 yıldı. Hastaların 41'i (%68,4) genç yaşlı, 17'si (%28,3) orta yaşlı ve 2'si (%3,3) ileri yaşlıydı. Özofagogastroduodenoskopide demir eksikliği anemisini açıklayabilecek en sık bulgular sırasıyla; atrofik gastrit %21,2, Helicobacter pylori pozitif gastrit %20, mide polipi %11,7, mide kanseri %3,3 iken, kolonoskopik bulgular ise sırasıyla kolon polibi %23,3 hastada, divertikül %15, anjiodisplazi %15, kolon kanseri %8,3 saptandı. Hastaların 44 (%73,3)'ünde internal hemoroid izlendi.

Sonuç: Yaşlı popülasyonda gastrointestinal sistemden kan kaybı demir eksikliği anemisinin en önemli nedeni olup, anal bakıda hemoroidlerin görülmesi tek başına demir eksikliği anemisini açıklayamamaktadır. Demir eksikliği anemisi tanısı alan hastaların etiyolojisi araştırılırken hem özofagogastroduodenoskopi hem de kolonoskopi yapılması altta yatan nedene ulaşmak ve olası bir malignitenin atlanmaması açısından doğru bir yaklaşımdır.

Anahtar Sözcükler: Demir eksikliği anemisi, yaşlı hasta, endoskopi, kolonoskopi.

INTRODUCTION

Iron-deficiency anemia (IDA) is the leading cause of anemia in the geriatric population worldwide (1-5). The frequency of etiological causes varies as per age groups in IDA. While the most important cause of IDA is menstrual bleeding in premenopausal women, it is chronic blood losses from the gastrointestinal system (GIS) in postmenopausal women and adult men. The prevalence of IDA in developed countries is 2%–5% in adult men and postmenopausal women, and this constitutes 13% of patients referred to gastroenterology (6, 7). The presence of IDA, an important indication for endoscopic procedures, in the geriatric population necessitates the exclusion of a possible malignancy in GIS (8).

There are not enough studies in Turkey on IDA in the geriatric population. This study aims to examine endoscopic results in a geriatric sample that underwent esophagogastroduodenoscopy and colonoscopy because of IDA.

MATERIAL AND METHODS

Sixty patients aged 65 and over who underwent esophagogastroduodenoscopy and colonoscopy for IDA between August 2019 and August 2020 were retrospectively evaluated. The data of patients were accessed from the endoscopy database and the hospital electronic patient files, and analyzed. Age, sex, age groups of the older adult patients, presence of Helicobacter pylori (Hp) in gastric biopsy, esophagogastroduodenoscopy and colonoscopy findings, presence of internal and/or external hemorrhoids, and duodenal biopsy results were recorded in the case report form. Endoscopic examinations were performed with GIF-HQ190 esophagogastroduodenoscopy (Olympus, Tokyo, Japan) and CFH-170L-CFQ-150L colonoscopy

(Olympus, Tokyo, Japan) devices by a gastroenterologist or a gastroenterology minor assistant under his supervision, accompanied by an endoscopy nurse.

Those with a known history of lower and/or upper GIS surgery, those with previous GIS malignancy, hematological malignancies, inflammatory bowel disease, and liver cirrhosis were excluded from the study. As defined by the World Health Organization, the older population is divided into three age groups: patients aged 65–74 years are defined as "young-old," 75–84 years as "middle-old," and 85 years and over as "old-old" (9).

Local ethics committee approval was obtained for the study (ethics committee decision date/number: 25.11.2020 / 20-11.1T/36). The research was conducted as per the principles of the Declaration of Helsinki.

Statistical Analyses

The compliance of the age variable to normal distribution was examined by visual (histogram) and analytical methods (Kolmogorov–Smirnov test). Age was presented as mean, median, standard deviation, and min-max, whereas categorical data were expressed by descriptive methods such as ratio and percentage. Chi-square test was then used for comparing categorical variables between groups. Values with a p value below 0.05 were considered statistically significant. SPSS Statistics Version 22.0 program was used for all statistical analyses and calculations.

RESULTS

Thirty (50%) of the 60 patients included in the study were male and the mean age was 72.47 ± 6.07 years. Of these patients, 41 (68.4%) were young-old, 17 (28.3%) were middle-old and 2

(3.3%) were old-old; Hp result was positive in 21 (35%) patients. The most common results in esophagogastroduodenoscopy in patients who underwent esophagogastroduodenoscopy and colonoscopy for IDA were as follows: normal upper GIS findings in 21 (35%) patients, atrophic gastritis in 13 (21.2%) patients, Hp-positive gastritis in 12 (20%) patients, gastric polyps in 7 (11.7%) patients, and gastric cancer in 2 (3.3%) patients. Colonoscopy results were as follows: normal lower GIS results in 16 (26.7%) patients, colon polyp in 14 (23.3%) patients, diverticulum in 9 (15%) patients, angiodysplasia in 6 (15%) patients, diverticulum and polyp in 6 (10%) patients and colon cancer in 5 (8.3%) patients. Internal hemorrhoids were observed in 44 (73.3%) patients. Duodenal biopsy was obtained from 32 (53.3%) of patients for the etiology of IDA; however, all biopsies were reported as normal mucosa (Table-1).

Fifty percent of the patients were using antiaggregant or anticoagulant drugs and the drug types used were acetylsalicylic acid (ASA) (26.7%), ASA + clopidogrel (11.7%), apixaban (5%) in order of frequency. One or more comorbidities were present in 98.4% of the patients. Three most common comorbidities were, respectively, hypertension, diabetes mellitus and coronary artery disease (Table-2). Iron-deficiency anemia causes in 11 patients (18.3%) from upper GIS, in 16 patients (26.7%) from lower GIS, in 28 (46.7%) patients from upper + lower GIS lesions. In 5 patients (8.3%) could not explain the cause of IDA with both procedures (Figure-1). There was no significant difference between esophagogastroduodenoscopy and colonoscopy findings as per the age group (p = 0.195 and 0.130) (Table-3).

Table-1. Demographic, clinical and endoscopic findings of patients.

	n (%)
Age (years) (Mean ± SD)	72.47 ± 6.07
Gender	
Female	30 (50)
Male	30 (50)
Age group	
65–74 years old (young old)	41 (68.3)
75–84 years old (middle old)	17 (28.3)
85 years and older (old old)	2 (3.3)
HP presence	
Negative	39 (65)
Positive	21 (35)
Esophagogastroduodenoscopy findings	
Normal	21 (35)
Atrophic gastritis	13 (21.7)
HP-positive gastritis	12 (20)
Polyp	7 (11.7)
Gastric cancer	2 (3.3)
Other*	5 (8.5)
Colonoscopy findings	
Normal	16 (26.7)
Polyp	14 (23.3)
Diverticulum	9 (15)
Angiodysplasia	6 (10)
Polyp + diverticulum	6 (10)
Other**	9 (15)
Internal and/or external hemorrhoids	
Yes	44 (73.3)
No	16 (26.7)
Duodenal biopsy	
Yes	32 (53.3)
No	28 (46.7)

HP, Helicobacter pylori

*Esophageal cancer (1), bulbus ulcer (1), angiodysplasia (1), gastric ulcer (1), HP-positive gastritis + hiatus hernia (1), **Colon cancer (5), polyp + angiodysplasia (2), terminal ileum ulcer (1), diverticulum + angiodysplasia (1).

Table-2. Comorbidities and antiaggregant and/or anticoagulant drugs used of the patients.

Antiaggregant and / or Anticoagulant Drugs	n (%)
Antiaggregants	
ASA	16 (26.7)
ASA + Clopidogrel	7 (11.7)
Clopidogrel	2 (3.4)
Anticoagulants	
Apixaban	3 (5)
Rivaroxaban	1 (1.6)
Warfarin	1 (1.6)
No anticoagulant or antiaggregant use	30 (50)
Number of Comorbidities	
No comorbidity	1 (1.6)
One comorbidity	10 (16.6)
Two comorbidities	20 (33.4)
Three or more comorbidities	29 (48.4)
Three Most Common Comorbidities	
HT	44 (73.3)
DM	30 (50)
CAD	17 (28.3)

ASA, Acetylsalicylic acid; HT, Hypertension; DM, Diabetes mellitus; CAD, Coronary artery disease.

Table-3. Comparison of esophagogastroduodenoscopy and colonoscopy findings of patients with iron-deficiency anemia by age groups.

FINDINGS	Age groups			p
	65-74	75-84	≥85	
Esophagogastroduodenoscopy findings				0.195
Normal	15 (36.6)	6 (35.3)	0 (0)	
Atrophic gastritis	6 (14.6)	7 (41.2)	0 (0)	
HP-positive gastritis	10 (24.4)	1 (5.9)	1 (50)	
Polyps	4 (9.8)	2 (11.8)	1 (50)	
Gastric cancer	1 (2.4)	1 (5.9)	0 (0)	
Other*	5 (12.2)	0 (0)	0 (0)	
Colonoscopy findings				0.130
Normal	12 (29.3)	4 (23.5)	0 (0)	
Polyps	12 (29.3)	2 (11.8)	0 (0)	
Diverticulum	5 (12.2)	4 (23.5)	0 (0)	
Angiodysplasia	5 (12.2)	0 (0)	1 (50)	
Polyp + diverticulum	4 (9.8)	2 (11.8)	0 (0)	
Other**	3 (7.3)	5 (29.4)	1 (50)	

HP, Helicobacter pylori

*Others: Esophageal cancer (1), bulbus ulcer (1), angiodysplasia (1), stomach ulcer (1), and HP-positive gastritis + hiatus hernia (1);

**Others: Colon cancer (5), polyp + angiodysplasia (2), terminal ileum ulcer (1), and diverticulum + angiodysplasia (1)
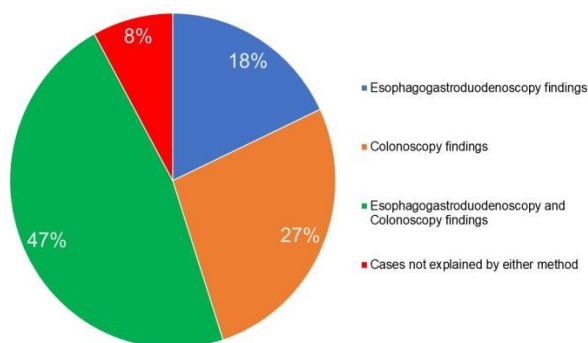
Figure-1. Endoscopic diagnostic methods in determining the etiology of iron-deficiency anemia.

DISCUSSION

IDA is one of the major health problems in the geriatric population, and the Third National Health and Nutrition Examination Survey (NHANES III, 1988-1994) demonstrated that the prevalence of IDA in the older adults is ~10.6% (2). Note that 63%–86% of IDA cases in the geriatric population are attributed to bleeding gastrointestinal lesions (10-14).

Although there are specific symptoms in GIS-related anemia, it is recommended that upper and lower gastrointestinal endoscopic examinations be performed concurrently. Because different etiological reasons may be together (12). While the cause of IDA cannot be determined in 30%–50% of those undergoing only gastroscopy in etiological evaluation, this rate decreases to 15% when gastroscopy and colonoscopy are performed together (15-17). Note that 20% of older patients have a negative upper and lower endoscopy, and two-thirds of these have a lesion in the small intestine (18). After negative standard dual endoscopic evaluations, it is important to examine the small intestine in all patients with unexplained IDA (19). In a study conducted by Çoban et al. on the etiology of IDA in the geriatric population in Turkey, although both upper and lower GIS endoscopy was performed, no etiological cause was reported in GIS scanning in 15.6% of patients (20). In our study, the results that could explain the IDA of the patients were reported only in esophagogastroduodenoscopy in 18.3% patients, only in colonoscopy in 26.7%, in both esophagogastroduodenoscopy and colonoscopy in 46.7% patients, and no results were detected in either endoscopic method in 8.3% patients. Compared to the literature, the ratio of patients in this study where either method failed to provide

any results is lower. This is possibly attributed to an experienced tertiary center; during the procedure, a team comprising a specialist physician, a minor assistant and an experienced nurse performed the procedure, which minimized possible overlooked lesions.

In the literature that in postmenopausal women and men >50 years of age, 2%–15% of patients were diagnosed with colorectal cancer and 2%–6% were diagnosed with upper gastrointestinal system cancer in investigations because of IDA (14, 21-23). In studies conducted in Turkey, a diagnosis of adenocarcinoma was made in 0.9%–7.7% of patients who underwent upper gastrointestinal endoscopy and in 4.7%–9.5% of patients who underwent lower gastrointestinal endoscopy for IDA (24, 25). In another study in Turkey in which endoscopy and colonoscopy was performed because of IDA in the geriatric population, upper GIS cancer was reported in 4.4%–7.3% of patients and colon cancer was reported in 6%–8.3% of them (18, 26). In this study, gastric cancer was reported in 3.3% and colon cancer in 8.3% of the cases. As per these results, the incidence of gastric cancer was less compared to other studies conducted in the geriatric population; however, the colon cancer incidence was similar to the rates reported in the literature.

In a study examining the cause of anemia because of chronic blood loss or malabsorption as per different age groups, bleeding lesions were reported to be 29% in adult patients (50–64 years) and 45.5% more in older patients (65–74 years). Iron-deficiency because of malabsorption (Hp-positive pangastritis, atrophic gastritis and celiac disease) was reported in 80.6% of adults and 56.2% of the older patients (27). Studies demonstrated that the prevalence of celiac disease in patients with IDA is 3%–15%, the prevalence of atrophic gastritis is 20–27%, and the rate of Hp-positive gastritis is 25%–44% (26, 28, 29). In this study, the rate of atrophic gastritis was 21.7% and Hp-positive gastritis was 20%, which is consistent with the literature. Furthermore, in this study, the rate of atrophic gastritis and Hp-positive gastritis was reported to be higher in the 75–84 age group compared to the 65–74 age group; however, statistical significance was not observed. Duodenal biopsy was considered for celiac disease in 53.3% of our cases; however, no disease was reported in any of the patients. These results support the

necessity of biopsy in terms of Hp-associated gastritis and atrophic gastritis, although there is no obvious lesion in the upper GIS examination in patients with IDA.

Hemorrhoids are one of the results obtained in examining the lower gastrointestinal system. In the literature, hemorrhoids have been reported in 39% of colonoscopies performed for routine colorectal cancer screening (30). In studies conducted in Turkey, hemorrhoids were reported with a rate of 13.6%–33.4% (25, 31, 32). In this study, 73.3% of patients had internal and/or external hemorrhoids. As per the literature, there is no clear explanation for this high rate; however, attributing anemia to hemorrhoids in patients with a history of hemorrhoids may lead to overlooking the presence of other underlying etiologies.

There are certain limitations of this study. These include the retrospective design, limited number of patients, lack of occult blood data in the stool, lack of information on the drugs regularly used by the patients, lack of information on patient symptoms, and lack of small intestinal examination in the patients with normal lower and upper endoscopic examinations.

CONCLUSION

In the older population, blood loss from GIS is the most important cause of IDA; hemorrhoids seen in anal examination alone cannot explain IDA. While examining the etiology of patients diagnosed with IDA, performing both esophagogastroduodenoscopy and colonoscopy is an accurate approach for illuminating the underlying cause and not missing a possible malignancy.

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Evaluation of patients hospitalized in a geriatrics clinic during normalization process of SARS CoV-2

SARS CoV-2 pandemisi normalleşme sürecinde geriatri kliniğinde yatan hastaların değerlendirilmesi

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ABSTRACT

Aim: The pandemic of Severe Acute Respiratory Syndrome-Coronavirus-2 was more severe and more fatal for elders and individuals who have chronic diseases. The treatment may be delayed due to the elders' "fear of infection" in hospitals. This study aimed to evaluate the data of older patients who were admitted to the Geriatrics clinic in the normalization period.

Materials and Methods: The data was retrieved between June-August 2020, retrospectively from the file database for older patients who were hospitalized in a geriatrics clinic of a university hospital.

Results: 23 patients were included in the study and their mean age was 81.4±7.4 years. The most common symptoms at admission were changes in consciousness, weight loss, and malnutrition, respectively. The duration of symptoms was less than a month in 56.5% of patients, 1-3 months in 17.4% of patients, and more than 3 months in 26.1% of patients. The most common indications were delirium, urinary tract infection, and acute renal failure, respectively 73.9% of patients applied from the outpatient clinics and 26.1% from the emergency clinic. The mean hospitalization duration was 24.2 ± 17,2 days. 43.5% of patients had delirium and 21.7% had pressure ulcers during their hospitalization.

Conclusion: The hospitalization indications had variations, outpatient hospitalizations were higher, and the duration of hospitalization was longer during normalization process of SARS CoV-2. Approximately, half of the patients had symptoms for more than a month and it is an important point to be investigated. In addition, geriatric syndromes such as delirium and pressure ulcer increased in this process.

Keywords: Elderly, inpatient, COVİD-19 pandemics.

ÖZ

Amaç: Yeni koronavirüse (SARS-CoV-2, Şiddetli Akut Solunum Yolu Sendromu Koronavirüsü 2) bağlı pandemi, kronik hastalığı olan bireylerde ve yaşlılarda daha şiddetli seyretmiş, daha sık ölümlere sebep olmuştur. Hastalık bulaşma korkusu, yaşlıların sağlık sorunları yaşadıklarında almaları gereken bakım ve tedavinin gecikmesine sebep olabilmektedir. Bu çalışmada, normalleşme sürecinde geriatri kliniğine yatışı yapılan ileri yaş hastaların değerlendirilmesi amaçlanmıştır.

Yöntem: Haziran-Ağustos 2020 tarihlerinde Ege Üniversitesi Tıp Fakültesi Geriatri kliniğine yatışı yapılan ≥65 yaş tüm hastaların verileri retrospektif olarak elektronik hasta dosya sisteminden elde edilmiştir. Çalışmaya sağlık bakanlığı ve etik kurul onayı alınması sonrasında başlanmıştır.

Bulgular: Çalışmaya 23 hasta (K/E: 12/11) dahil edilmiş olup ortalama yaşları 81,4± 7,4 (68-94) yıldır. En sık başvuru semptomlarını hastaların %34,7'sinde bilinç değişikliği, %17,3'ünde kilo kaybı ve %13'ünde beslenme bozukluğu oluşturmaktadır.

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Semptomlar, hastaların %26,1'inde 3 aydan daha uzun süredir, %17,4'ünde 1-3 ay arasında, %56,5'inde ise bir aydan daha kısa süredir mevcuttur. En sık yatış endikasyonlarını hastaların %26'sında deliryum, %17,3'ünde idrar yolu enfeksiyonu, %17,3'ünde akut böbrek yetmezliği oluşturmaktadır. Yatan hastaların %73,9'u poliklinikten, %26,1'i acilden başvurmuştur. Hastanede ortalama yatış süreleri 24,2 ± 17,2 gündür. Hastane yatışları sırasında, hastaların %43,5'inde deliryum, %21,7'sinde ise bası yarası saptanmıştır.

Sonuç: *Bu çalışma sonucunda SARS-CoV-2 pandemisi normalleşme sürecinde, yatış endikasyonlarının çeşitli olduğu, poliklinikten yatışların daha fazla olduğu ve yatış süresinin uzun olduğu saptanmıştır. Hastaların yaklaşık yarısında semptomların 1 aydan uzun süredir olduğu görülmüştür ve bu konu araştırılması gereken bir noktadır. Ayrıca, deliryum ve bası yarası gibi geriatrik sendromların bu süreçte arttığı görülmüştür.*

Anahtar Sözcükler*: Yaşlı, yatan hasta, COVİD-19 pandemisi.*

INTRODUCTION

The cases of viral pneumonia reported in city of Wuhan, China in December 2019 were subjected to sequence analyses, and the causative agent was named the 2019 novel coronavirus (2019-nCoV) (1, 2). This novel coronavirus was officially named Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), and the infection caused by this virus was named Coronavirus Disease 2019 (COVID-19) (3). After cases started to be reported worldwide in addition to China, the World Health Organization (WHO) declared the outbreak a pandemic on March 11, 2020.

At the end of December 2020, the number of cases reported worldwide exceeded 80 million, with over 1.8 million deaths attributed to SARS-CoV-2 infection. In Turkey, according to the data as of the end of December, the number of people with confirmed COVID-19 was over 2 million, while deaths from SARS-CoV-2 infection numbered over 20,000 (4). The effects of the disease caused by the novel coronavirus (SARS-CoV-2) are particularly severe in the elderly and in those with chronic diseases, resulting even in death. The highest risk group are those aged 85 or older. The estimated risk of mortality is 8% in the 70–79 years age group, compared to 14% in those aged ≥80 years (5).

After the risk of mortality associated with coronavirus in the elderly was identified, a curfew was imposed on those aged ≥65 in our country (6). The dramatic change brought about by the social distancing measures brought significant challenges to the maintenance of the health and well-being of community-dwelling older adults, particularly those who were frail, very old or with multiple chronic conditions (7). Older adults are at a high risk of death from COVID-19, and this age group is also associated with high rates of morbidity and mortality due to the presence of other acute and chronic conditions. They adapt poorly to aggressive physical distancing and the resulting changes in health system structures. When health problems occur, fear of infection may delay the provision of necessary care and treatment in the elderly.

After the number of cases decreased and the necessary measures were taken, a normalization period was initiated, including the lifting of the curfew imposed on people aged ≥65 on 03.06.2020 (8). We present here an evaluation of elderly patients who were admitted to a Geriatrics clinic in the normalization period, and who had been affected by the pandemic and the resulting isolation.

MATERIALS AND METHODS

With the reorganization of beds due to the pandemic, no patients could be admitted to the geriatrics clinic of Ege University Medical Faculty Hospital between March and May 2020. Upon a decline in the number of cases, the curfew was lifted, and a period of normalization was initiated in June 2020, when patients requiring hospitalization for reasons other than COVID-19 stated to be admitted again. This study included all patients aged ≥65 years who were admitted to the inpatient ward of the Geriatrics Clinic of Ege University Medical Faculty Hospital between June and August 2020 (in the normalization period). The demographic data, presenting symptoms, duration of presenting symptoms, living alone or with family before admission, comorbidities, indications for hospitalization and length of hospital stay of all patients were retrieved from the electronic medical record system. Data on the frequency of pressure sores and delirium among the geriatric syndromes

detected at admission were retrieved from the patients' medical records. In addition, the presence of fever at admission was examined, and the rates and results of any COVID-19 tests performed were noted on the questionnaire forms. This retrospective study was approved by the Ministry of Health (Form No: 2020-08-31T21_23_39) and by the Ethics Committee of the Ege University Faculty of Medicine (Date: 11.25.2020, No: 20-11.1T / 40).

All study data were assessed using IBM SPSS Statistics (Version 21.0. Armonk, NY: IBM Corp.). For the quantitative variables, normally distributed variables were summarized using mean and standard deviation, while median, maximum and minimum values were used to express non-normally distributed variables. For qualitative variables, a frequency analysis was carried out as a descriptive statistical method.

RESULTS

The study included 23 patients admitted to the inpatient ward of the Geriatrics Clinic of Ege University Medical Faculty Hospital between June and August 2020. Of these patients, 12 (52.1%) were female and 11 (47.8%) were male. The mean age of the overall sample was 81.4 ± 7.4 (68–94) years, 83.3 ± 7.03 (72–94) years for female patients and 79.3 ± 7.6 (68–89) years for male patients. Only two (8.7%) of the patients were living alone prior to admission to hospital.

Table-1. Common presenting symptoms and indications for hospitalization.

	All patients n, (%)
Symptom	
Change in consciousness	8 (34.7)
Weight loss	4 (17.3)
Malnutrition	3 (13)
Fever	3 (13)
Falls	3 (13)
Skin eruption	2 (8.6)
Shortness of breath	2 (8.6)
Skin ulcer	1 (4.3)
Abdomen distension	1 (4.3)
Rectal bleeding	1 (4.3)
Hospitalization indication	
Delirium	6 (26)
Urinary tract infection	4 (17.3)
Acute renal failure	4 (17.3)
Malignancy examination	3 (13)
Aspiration pneumonia	2 (8.6)
PEG tube placement	2 (8.6)
Decompensated heart failure	2 (8.6)
Bullous pemphigoid	1 (4.3)
Gastroenteritis	1 (4.3)
Wound infection	1 (4.3)
Acid etiology	1 (4.3)
GIS bleeding	1 (4.3)

PEG, Percutaneous Endoscopic Gastrostomy; GIS, Gastrointestinal System.

Table-2. Chronic diseases of study patients.

Chronic diseases	All patients n, (%)
Hypertension	19 (82.6)
Heart failure	13 (56.5)
Dementia	12 (52.2)
Diabetes mellitus	12 (52.2)
Chronic renal failure	12 (52.2)
Coronary artery disease	8 (34.7)
Atrial fibrillation	7 (30.4)
Malignancy	7 (30.4)
Cerebrovascular accident	5 (21.7)

When the presenting symptoms of the 23 study patients were examined, the most common symptoms were found to be altered states of consciousness, followed by weight loss and malnutrition. The common presenting symptoms are provided in detail in Table-1. Some of the patients presented with more than one symptom: two patients presented with an altered state of consciousness accompanied by urinary tract symptoms; one patient with malnutrition and weight loss, one patient with an altered state of consciousness, fever and cough; and one patient with rectal bleeding, accompanied by weight loss. An analysis of the time from the onset of symptoms to hospital admission revealed that six (26.1%) of the patients had complaints for more than 3 months, four (17.4%) had complaints for 1–3 months and 13 (56.5%) for less than one month.

The most common indications for hospitalization were delirium, urinary tract infection and acute renal failure, in a decreasing order of frequency (Table-1). The indications for hospitalization are presented in detail in Table-1. Some patients had multiple indications for hospitalization: three patients were admitted due to delirium and urinary tract infections; one due to delirium and acute renal failure; and one due to aspiration pneumonia and indications necessitating an anemia examination. Of the sample, 17 (73.9%) of the patients were admitted after presenting to the outpatient clinic and six (26.1%) to the emergency department.

The most common chronic diseases among the patients under follow-up were hypertension, heart failure, dementia, and diabetes mellitus, in decreasing order of frequency. Comorbid chronic diseases are presented in detail in Table-2.

The mean length of hospital stay of the study patients was 24.2 ± 17.2 days. At the time of admission, delirium was identified in 10 (43.5%) patients and pressure sores in five (21.7%) patients, while 11 (47.8%) of the patients had elevated body temperatures at admission. 19 of the patients (82.6%) underwent at least one COVID-19 PCR test was performed, and all tests were negative. Of the total, three (13%) patients died during their hospital stay.

DISCUSSION

The present study examined elderly patients who were hospitalized in the period of normalization under the COVID-19 pandemic, and found the indications for hospitalization to be diverse, hospitalization to be more common following outpatient visits and the length of stay to be prolonged. Approximately half of the patients had experienced the presenting symptoms for more than one month. There was also an increase in geriatric syndromes such as delirium and pressure sores in this period.

The COVID-19 pandemic has led to a unique psychological and socioeconomic situation as a result of its individual, social and global effects. Social distancing, quarantine, travel restrictions, school and workplace closures, and cancellations of sports and art activities have led to a pause in normal life (9). During the COVID-19 pandemic, the medical control visits of non-emergency patients have been cancelled, leading to necessary treatment changes not being made, and resulting in the poor control and management of chronic diseases (10-12). Incompliance with drug therapies in this period has been observed to result in severe acute and chronic complications in the elderly with chronic diseases (9). Several studies have reported pressure sores among inpatients in frequencies ranging from 5.5% to 17.5%, while the frequency was 21.7% in the present study (13-15). The prevalence of delirium among inpatients has

been reported in a range of 10–30% in various studies, while the prevalence was 43.5% in the present study (16).

In previous studies, the mean length of hospital stay of the elderly patients was 5.2 days, with prolonged hospitalization described as a stay in hospital for more than 13 days (17-19). In the present study, the mean length of hospital stay was 24.2±17.2 days. The elderly patients with chronic diseases in the present study were admitted to our clinic with various indications. It was believed that the hospital stay was prolonged because hospital admissions were due to complications and accompanying geriatric syndromes such as pressure sores and delirium were common in patients. Considering the increasing prevalence of chronic conditions with age and the occurrence of chronic conditions mostly in the elderly, it is believed that the progression of diseases and the development of complications may affect individual and social well-being by placing greater burdens on both the patients and the healthcare system (20).

The increased allocation of healthcare resources to COVID-19, the reduction in the number of procedures offered at polyclinics, and the non-referral or delayed referral of patients to healthcare facilities due to a fear of infection are likely to prevent early interventions in diseases, to decrease hospital admissions for serious non-COVID-19 diseases, to cause inpatients to present with prolonged symptoms, and to make diseases become more complicated (21). The present study found that half of the patients presented to the hospital and were admitted to the ward with complaints that had lasted for more than one month. Similar problems in healthcare systems and services have been reported during previous outbreaks. A study in Taiwan during the SARS outbreak reported that outpatient treatments decreased by 23.9%, inpatient treatments by 35.2%, and referrals for dental health by 16.7% (22). In another study involving 79 patients receiving chemotherapy at a hospital in Taiwan during the SARS outbreak, approximately two-thirds of patients reported being concerned about going to the hospital due to their fear of infection, and 2.7% delay in

planned chemotherapies was recorded (23). A study in Sierra Leone, in turn, reported that hospital admissions in the country decreased by 7%–32% in various regions during the Ebola outbreak (24).

The experience gained during previous outbreaks of other agents of the same coronavirus family has shown that the harmful effects of such outbreaks are not just limited to acute complications (25). The potential long-term complications of COVID-19 reported in previous studies suggest that the disease may threaten the functional competence of individuals in the future (26). Self-isolation can lead to lack of exercise, and thus to frailty and falls, resulting in disability, making it important to conduct research on this subject.

The limitations of this study included the small sample size and the short duration of the study, which can be attributed to the decrease in both outpatient visits and referrals to hospitals for various reasons in the normalization period under the COVID-19 pandemic. A second wave in the COVID-19 pandemic brought an end to the period of normalization, preventing the duration of the study being extended further

CONCLUSION

While senior adults are at a greater risk of death from COVID-19 than young adults, medical care for non-COVID-19 conditions should not be neglected. It should be noted that physical distancing and social isolation can cause severe damage not only to mental health, but also to physical health and mental functioning. During the pandemic, it is also important to pay attention to the challenges faced by frail older adults resulting from physical distancing, and to directly address such challenges.

This study was presented as an oral presentation at the International Symposium of World Shaking Pandemic SARS-CoV-2 and Elderly Health, held online on September 29–30, 2020.

Conflict of interest

No potential conflict of interest was reported by the authors.

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Comparison of fall risk and risk factors between inpatients aged under 65 years and above in an internal medicine clinic

İç hastalıkları servisinde yatan 65 yaş altı ve üstü hastaların düşme riski ve risk faktörlerinin karşılaştırılması

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ABSTRACT

Aim: The aim of this study is to retrospectively evaluate and compare fall risk and risk factors inpatients aged under 65 years and above in an internal medicine clinic.

Materials and Methods: The study is retrospective and descriptive. The study included 224 patients who were hospitalized for any complaint in the internal medicine clinic of a university hospital between June 2019 and August 2019, and whose data on falls were fully recorded. The sociodemographic variables of the patients, chronic diseases, the number of drugs and the number of risky drugs for falls, and the data of the Itaki fall risk scale were recorded.

Results: The mean age of the patients was 63.18 ± 17.66 (23-95) years. A statistically significant difference was found between inpatients aged under 65 years and above in terms of itaki fall risk score, number of chronic diseases, hypertension, diabetes mellitus, heart disease, neurological diseases and number of drugs, number of risky drugs, antidiabetic and antiarrhythmic drugs. A statistically significant difference was found between inpatients aged under 65 years and above in terms of fall risk according to the Itaki fall risk scale (p = 0.038).

A statistically significant difference was found between inpatients aged under 65 years and above with a high risk of falling in terms of the number of chronic diseases (p = 0.001), presence of diabetes mellitus (p = 0.007), presence of hypertension (p = 0.001), presence of heart disease (p = 0.002), presence of neurological disease (p = 0.03), and number of risky drugs (p = 0.01).

Conclusion: Falls are an important problem in all age groups. Although fall risk is higher inpatients aged 65 years and above, care should be taken in terms of precautions to be taken to prevent falls in all patients. All risk factors associated with falls should be questioned in all hospitalized patients.

Keywords: Elderly, young, fall, fall risk, hospitalized patient.

ÖZ

Amaç: *Bu araştırmanın amacı, bir üniversite hastanesi iç hastalıkları kliniğinde yatan 65 yaş altı ve üstü hastalarda düşme riski ve risk faktörlerinin retrospektif olarak değerlendirilmesi ve karşılaştırılmasıdır.*

Gereç ve Yöntem: *Araştırma retrospektif, tanımlayıcı tipte olup, araştırmaya Haziran 2019 - Ağustos 2019 tarihleri arasında bir üniversite hastanesinin iç hastalıkları kliniğinde herhangi bir yakınma nedeniyle yatarak tedavi görmüş dosyasında düşme ile ilgili verileri eksiksiz olarak kaydedilmiş olan 224 hasta dahil edilmiştir. Hastaların sosyo-demografik değişkenleri, kronik hastalıkları, hastaneye yatış sırasında kullanılan ilaç sayısı ve düşme için riskli ilaç sayısı gibi klinik verileri ve İtaki düşme riski ölçeği verileri kaydedilmiştir.*

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Bulgular: *Hastaların yaş ortalaması 63,18 ± 17,66 (23-95) yıldır. 65 yaş altı ve 65 yaş ve üstü hastalar arasında İtaki düşme skoru, kronik hastalık sayısı, kronik hastalık varlığı, hipertansiyon, diabetes mellitus, kalp hastalığı, nörolojik hastalıklar, kullanılan ilaç ve riskli ilaç sayısı, düşme için riskli ilaçlardan antidiyabetik ve antiaritmik ilaçlar açısından istatistiksel olarak anlamlı fark bulunmuştur. İtaki düşme riski ölçeğine göre düşme riski açısından 65 yaş altı ve 65 yaş ve üstü hastalar arasında istatistiksel olarak anlamlı fark bulunmuştur (p = 0,038). Yüksek düşme riski olan <65 yaş ve ≥65 yaş gruplar karşılaştırıldığında kronik hastalık sayısı (p = 0,001), DM varlığı (p = 0,007), HT varlığı (p = 0,001), kalp hastalığı varlığı (p = 0,002), nörolojik hastalık varlığı (p = 0,03) ve riskli ilaç sayısı (p = 0,01) açısından iki grup arasında istatistiksel olarak anlamlı fark bulunmuştur.*

Sonuç: *Düşmeler tüm yaş gruplarında önemli bir sorundur. Özellikle 65 yaş ve üstü grupta düşme riski daha yüksek saptanmasına rağmen tüm hastalarda düşmelerin engellenmesi için alınacak önlemler açısından dikkatli olunmalıdır. Hastaneye yatan tüm hastalarda düşmeler ile ilişkili tüm risk faktörleri sorgulanmalıdır.*

Anahtar Sözcükler: *Yaşlı, genç, düşme, düşme riski, yatan hasta.*

INTRODUCTION

A fall is defined as an individual becoming immobile at a lower level than the current level not led by a force, syncope or a stroke but due to lack of attention and loss of balance (1, 2). In order to prevent one of the most frequently observed accidents throughout the world which is falling, safe environments have to be provided (3, 4). It is not possible to clear the fall risk of inpatients however; with the assessment of the fall risk, an efficient prevention program can be constituted which can minimize the risk (5, 6). It is indicated that physiological changes and chronical diseases caused by aging increase the risk of falls (7, 8). It is also stated that 2.9 to 13 of 1000 hospitalized patients fall (4). More than 80% of the falls that occur in hospitals are observed in the individuals aged 65 years and above (9). In a study conducted in Turkey, the fall rate of hospitalized patients aged 65 years and above is stated as 10% (10). Even though falls are common in the older adults, every hospitalized patient encounters the fall risk regardless of their age.

Falls might lead to injuries such as skull fractures, subdural hematoma and massive bleeding as well as delayed recovery, prolonged hospital stay, increased care costs, decreased quality of life, fear of falling, mortality, morbidity, immobility, and early placement in nursing home (11, 12).

Intrinsic risk factors for falling include a history of falling, gait and balance disorder, peripheral neuropathy, vestibular impairment, muscle weakness, hearing and vision impairment, incontinence and nocturia, advanced age, orthostatic hypotension, dementia, depression anxiety, polypharmacy, and risky medication use.

Environmental factors, unsuitable footwear and obstacles are also extrinsic risk factors (4, 13).

The aim of this study is to retrospectively evaluate and compare fall risk and risk factors inpatients aged under 65 years and above in an internal medicine clinic.

MATERIALS AND METHODS

The study has been retrospective and descriptive with the sample being 269 patients admitted to and treated by an internal diseases clinic of a university hospital between the dates of June-August 2019 with any type of complaints. Patient files have been scanned retrospectively. Afterwards, 224 patients whose data on falls were fully recorded have been included to the study. The research protocol was approved by the local ethics committee on January 01, 2020 (Approval Number: 22.01.2020/20-1.1T/56). Patients' sociodemographic variables such as age and gender; their clinical data such as chronical diseases, the number of drugs, and risky drugs (psychotropic drugs, sedative hypnotic drugs, antipsychotics, neuroleptics, antidepressants, diuretics, antidiabetics, antiarrhythmics, antihypertensives, chemotherapeutics, laxatives, corticosteroids) they used on the first day of hospitalization and and Itaki fall risk scale scores which is performed on every inpatient have been recorded.

Itaki fall risk scale has been prepared for patients aged 17 years and above. It includes patients' demographics, the reason why the assessment is being administered and lastly the minor and major risk factors. The scale includes a total of 19 risk factor questions; 11 minor and 8 major ones that cause patients to fall. Minor risk factors count

as 1 point while major risk factors count as 5 points. If the total score of a patient is between 0-4, the risk is considered as low and if it is 5 or above, the risk is considered as high. Itaki fall risk scale has been published in 2011 by Turkish Health Ministry Head of Performance Administration and Quality Improvement Department (14).

Statistical analyses

SPSS Statistics Version 22.0 program was used for all statistical analyses and calculations. During the analysis process; percentages, averages, chi square analysis, Fisher's Exact test and Mann Whitney U test have been employed. Kolmogorov-Smirnov test was used to evaluate the normal distribution. Values with a p value <0.05 were considered statistically significant.

RESULTS

224 patients hospitalized in internal diseases clinic have been included in our study. 104 (46.4%) of the patients were aged under 65 years and 120 (53.6%) of them were aged 65 and above. The mean age of the patients was 63.18 ± 17,66 years (23-95) (aged under 65 years 47.08 ± 11.07; 65 and aged above 65 years 77.13 ± 7.47). Sociodemographic and clinically descriptive characteristics of the inpatients were shown in Table 1. 97.8% of the patients had at least one chronical disease. The most frequently observed chronical diseases were hypertension (55.8%), chronical renal failure (45.5%) and diabetes mellitus (33.9%).

A statistically significant difference was found between the two age groups in terms of Itaki fall risk scale score, the number of chronical diseases; the presence of chronical disease, hypertension (HT), diabetes mellitus (DM), heart disease, neurological diseases and other diseases; the number of drugs and risky drugs used, anti-diabetic and antiarrhythmic drugs from risky drugs for falls (Table-1-2).

Table-1. Sociodemographic and clinically descriptive characteristics of the inpatients.

Characteristic	Total n = 224	Aged <65 n = 104	Aged ≥65 n = 120	p
Gender, n (%)				0.40[a]
Female	108 (48.2)	47 (43.5)	61 (56.5)	
Male	116 (51.8)	57 (49.1)	59 (50.9)	
Itaki fall risk scale score[*]	10.6 ± 4.16	8.63 ± 4.0	11.3 ± 3.92	**0.001**[b]
Number of chronic diseases[**]	2 (1-6)	2 (1-5)	3 (1-6)	**0.001**[b]
Presence of chronic diseases, n (%)	207 (92.4)	85 (42.5)	115 (57.5)	**0.001**[*]
Chronic Diseases, n[†] **(%)**[††]				
HT	125 (55.8)	41 (39.4)	84 (70)	**0.001**[a]
DM	76 (33.9)	24 (23.1)	52 (43.3)	**0.001**[a]
Heart Disease	53 (23.7)	13 (12.5)	40 (33.3)	**0.001**[a]
CRF	102 (45.5)	51 (49)	51 (42.5)	0.327[a]
Malignancy	47 (21)	23 (22.1)	24 (20)	0.70[a]
Neurological diseases	31 (13.8)	9 (8.7)	22 (18.3)	**0.036**[a]
Others	86 (38.4)	43 (41.4)	43 (35.8)	**0.008**[a]
Number of drugs[**]	5 (0-16)	4 (0-16)	5 (0-13)	**0.014**[c]
Number of risky drugs[**]	2 (0-8)	1 (0-7)	2 (0-8)	**0.002**[c]

[a] Chi square test, [b] Mann-Whitney U test, [c] Fisher's Exact test, [*]Mean ± Standard deviation, [**]Median (minimum-maximum), [†] There has been given more than one answer, [††] Percentages has been calculated for the number of people who have chronical disease diagnosis. HT, hypertension; DM, diabetes mellitus; CRF, chronical renal failure; Others, muscle skeletal system diseases, psychiatric disorders.

Table-2. The relationship between the risky drugs and age groups.

Risky drugs	Total n (%)	<65 age n (%)	≥65 age n (%)	p[*]
Psychotropic drugs	68 (30.4)	29 (27.9)	39 (32.5)	0.45
Anticoagulant drugs	85 (37.9)	33 (31.7)	52 (43.3)	0.74
Diuretic drugs	69 (30.8)	28 (26.9)	41 (34.2)	0.24
Antidiabetic drugs	62 (27.7)	22 (21.2)	40 (33.3)	**0.04**
Antihypertensive drugs	69 (30.8)	29 (27.9)	40 (33.3)	0.38
Antiarrhythmic drugs	25 (11.2)	5 (4.8)	20 (16.7)	**0.005**
Narcotic analgesic drugs	33 (14.7)	16 (15.4)	17 (14.2)	0.80

[*] Chi square test has been used.

Table-3. The relationship between age groups and Itaki fall risk scale scores.

	Aged <65 n (%)	Aged ≥65 n (%)	p
Fall risk, n (%)			**0.038**
Low Risk	12 (70.6)	5 (29.4)	
High Risk	92 (44.4)	115 (55.6)	

Table-4. The relationship of patients at high risk of falling with risk factors.

Risk factors	<65 yaş n (%)	≥65 yaş n (%)	p
Number of chronic diseases[*]	2 (0-5)	3 (0-6)	**0.001**[a]
Presence of chronic diseases	80 (42.1)	110 (57.9)	**0.024**[b]
Chronic diseases			
DM	24 (32)	51 (68)	**0.007**[b]
HT	38 (31.4)	83 (68.6)	**0.001**[b]
Heart disease	13 (25.5)	38 (74.5)	**0.002**[b]
Neurological disease	8 (26.7)	22 (73.3)	**0.03**[b]
Number of risky drugs	76 (44.2)	96 (55.8)	**0.01**[a]

[*]The values were given as median (minimum-maximum). [a]Mann-Whitney U Test; [b] Chi-square Test

According to the Itaki fall risk scale scores, 88.5% of the patients who were aged under 65 years and 95.8% of the patients who were aged 65 and above were considered in the high-risk group. A statistically significant difference was found between the two age groups in terms of fall risk according to the Itaki fall risk scale (p = 0.038) (Table-3).

When two age groups with high-risk of fallling are compared; a statistically significant difference was found between the two age groups in terms of the number of chronic diseases (p = 0.001), presence of DM (p = 0.007), HT (p = 0.001), heart disease (p = 0.002), neurological disease (p = 0.03), and number of risky drugs (p = 0.01) (Table-4).

A statistically significant difference was found between the two age groups in terms of consciousness open / not cooperative, visual impairment, need for physical support and chronical diseases (Table-5).

Table-5. The relationship between the risk factors in the Itaki fall risk scale and the age groups.

Risk Factors	<65 yaş n = 104	≥65 yaş n = 120	p
Consciousness open, not cooperative	2 (14.3)	12 (85.7)	**0.013**[*]
History of falls in the last month	3 (30)	7 (70)	0.35[*]
Vision			
Poor vision	11 (26.8)	30 (73.2)	**0.005**[*]
Visual impairment	2 (50)	2 (50)	1.00[**]
Need for physical support	9 (28.1)	23 (71.9)	**0.02**[*]
Urinary / Fecal incontinence	2 (28.6)	5 (71.4)	0.45[*]
Use of risky drugs in the last week	85 (45.2)	103 (54.8)	0.40[*]
Medical equipment maintenance			
Three and more	45 (45)	55 (55)	0.70[*]
Less than three	32 (50)	32 (50)	0.50[*]
Orthostatic hypotension	0	1	1.00[*]
Dizziness	0	3	0.25[*]
Loss of balance	10 (34.5)	19 (65.5)	0.17[*]
Use of more than four drugs	15 (44.1)	19 (55.9)	0.77[*]
Presence of chronic diseases	85 (42.5)	115 (57.5)	**0.001**[*]
Physical disability	1 (16.7)	5 (83.3)	0.22[**]

[*]Chi square test, [**]Fisher's Exact Test

DISCUSSION

Falls are a serious problem that increase mortality and morbidity and lead to a decrease in physical, psychological and social life satisfaction due to complications. Most of the factors that lead to falls can be prevented. Therefore, describing falls and identifying, eliminating or preventing risk factors would decrease the frequency of falling.

The literature indicates that falls are the most frequently observed in physical treatment and rehabilitation, internal diseases, geriatrics and neurology clinics (10, 15-17). In the studies conducted by Kerzman et al. (16), Krauss et al. (18) and Fischer et al. (19), among inpatients, the ages between 50-70 have been determined to be risky. The literature has also indicated the age of 65 and above to be a risk factor for falling (17,18, 20-23). In a study conducted with a group of patients hospitalized in an internal diseases' clinic have found a statistically significant relationship between old age and fall risk (24) as we have found in our study. In a study conducted with inpatients from neurology and neurosurgery clinics have found that risk of falling is higher for patients aged 60 and above than for patients below 60, even though the difference is not statistically significant (10). Coherent with this study, we have observed that the fall risk inpatients aged 65 and above is higher and found a statistically significant difference between the two age groups in their fall risk. Difference between the results can be explained by the characteristics of the patients included in the study and the scales used to measure fall risk.

When two genders are compared in terms of their fall risk, some studies have reported a difference while some studies have not (16, 25-31). Difference between the results can be explained with the difference in the proportion of each gender observed in the samples of the studies. In a study, it has been found that among a high-risk of falling inpatients, 56.7% are men (32). In our study, among patients at a high-risk of falling, 50.7% have found to be men. Apart from that, we have found that among the patients aged under 65, men have a higher risk of falling while among the patients aged 65 and above women have a higher risk of falling. However, there has not been found a statistically significant difference between the two age groups.

In a study, it has been found that while 13.7% of the inpatients have experienced 1-2 falls in the last three months; 1.5% have experienced 3 or more falls (32). In the literature, a history of falling is considered as a risk factor in fall risk assessments (17, 21, 33). It has also been found that 20.9% of the inpatients had a history of falling in the last three months and that there was a statistically significant relationship between the high risk of falling and a history of falling in the last three months (10). The same significant relationship has been found in other studies as well (34, 35). We have also found that 4.5% of our patients had a history of falling in the last month and no statistically significant relationship was found between the risk of falling and the history of falling in the last 1 month. The reason for this can be the Itaki fall risk scale asking whether a history of falling in the last month is one of the minor risk factors for falling or not. If it asked whether a history of falling in the last three months or a year rather than a month was one of the minor risk factors, then the results could have been different.

The presence of chronical diseases causes people to lose their moving abilities which creates a risk for falling (36, 37). Chronic diseases increase the risk of falling (13, 37, 38). Also, many studies have found a significant relationship between the presence of chronical diseases in older adults and a high-risk of falling (37, 39-40). We as well have found a statistically significant difference between the two age groups with a high risk of falling in terms of presence and number of chronic diseases.

The frequency of falls in patients with diabetes was 39% and it is observed the most in older adults (41). We have also found a statistically significant difference between the two age groups with a high risk of falling in terms of the presence of DM. It is indicated that the most frequent diagnosis the patients who fall get was hypertension (86%) (18, 25, 42). In our study, we as well have found that the most frequent diagnosis the patients got to be hypertension (55.8%) and that there is a statistically significant relationship between hypertension and a high risk of falling in the group aged 65 and above. The reason for that is thought to be the increasing frequency of incidence of hypertension in the patients with increasing age (43). Heart diseases which is observed frequently in older patients have also been indicated to be related with a high

risk of falling (37, 39). Coherent with this finding, we also have found a statistically significant difference between two age groups with high-risk of fallling in the presence of heart diseases.

One of the common side effects of drugs is falls and there has been found a relationship between polypharmacy and falls (44). Kallin (21) and Reifkolh et al. (45) have indicated that use of four or more drugs increase the risk of falling. In some studies polypharmacy has shown to be related with falls (46, 47) while in other studies this relationship has not been observed (37). In our study, there has not been found a significant difference in use of four and more drugs and number of drugs between the two age groups with a high-risk of falling. However, when all the age groups were observed, an increase in the number of drugs used has been found to be related with an increase in the risk of falling. This result leads to the questioning of whether the number of drugs used by a patient influences the risk of falling regardless of age or not.

According to the results of a meta-analysis, it has been indicated that psychotropic drugs are related with the increase in the risk of falling, anticonvulsants and antiarrhythmic drugs can lead to an increase in the risk of falling, chronic use of antihypertension drugs are presumably not related with an increase in the risk of falling and cardiac and narcotic analgesic drugs are not related with an increase in the risk of falling (45, 48, 49). In our study, there was a significant difference in terms of number of high-risk drugs between the two age groups with a high-risk of falling. It has been found that the number of risky drugs used is higher in high risk patients aged 65 years and over. It has been found that the number of risky drugs used was higher inpatients aged 65 years and above with a high-risk of falling.

The using physical support for walking, and poor vision are considered as risk factors for falls in older adults (21). Coherent with this finding, we as well have found that poor vision and the using physical support for walking which both are risk factors have been observed more frequently in older patients in comparison to younger patients. In the literature, the presence of changes in the level of consciousness is also considered as the risk factor for falling (16, 17, 19, 50). We have found that the presence of changes in the level of consciousness which affects the risk of falling is

observed more frequently in the group aged 65 and above.

The limitations of the study include the various individuals who have administered the Itaki fall risk scale to the patients and the lack of sociodemographic data in the files of some patients.

CONCLUSION

As a consequence, with the assessment of the risk factors for falling in the patients aged under and above 65, some differences have been detected however, falls are an important problem in all age groups. Even though the risk of falling has been found to be higher in the group aged 65 and above, precautions for avoiding patients from falls must be taken carefully. Every hospitalized patient must be questioned about their risk factors for falls. Our study was carried out in order to determine the deficiencies in the precautions related to falls that will occur in the patients hospitalized in the internal medicine service and to contribute to the creation of protocols for preventing falls in the hospitals of the patients.

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Two months of protein–rich dietary recommendations for older patients at risk of malnutrition improves nutritional status, and decreases body fat percentage

İki aylık proteinden zengin beslenme önerileri malnütrisyon riski altındaki yaşlı hastalarda nütrisyonel durumu düzeltir ve vücut yağ oranını azaltır

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ABSTRACT

Aim: It is aimed to evaluate the impact of protein – rich dietary (PRD) recommendations on the body composition of older patients at malnutrition risk (MR) in this study.

Materials and Methods: Patients ≥65 years of age, without cognitive problems, diabetes, renal diseases, admitted to Internal Medicine Nutrition Outpatient Clinic consecutively were screened, and 30 patients in normal nutritional status (NS), 30 patients at MR were planned to be enrolled. Body compositions, NS, and anthropometric measurements were performed. Patients at MR were trained for PRD recommendations. Evaluations were repeated in both groups after two months.

Results: Sixty older patients were enrolled (mean age 72.5 ± 6.2; Female / Male: %63.3 / %36.7). After two months; in the group at MR (n = 30); there was a significant decrease in mean body fat ratio (P = 0.036), increase in body water ratio and Mini Nutritional Assessmnet – Short Form (MNA-SF) score (P = 0.020 and P < 0.001). Mean body weight (BW) , body mass index (BMI), waist – hip circumference, fat mass, fat free mass (FFM) and calf circumference were similar. In the normal NS group (n = 30) mean BW, waist – hip circumference, fat mass, FFM, calf circumference values significantly decreased (P = 0.001, P = 0.021, P = 0.016, P = 0.025, P = 0.002, P = 0.017, respectively), and BMI, fat ratio, body water and MNA – SF scores were similar.

Conclusion: In the group at MR, PRD recommendations improved NS, and fat ratio decreased. In patients given general nutritional recommendations with normal NS; BW, waist – hip circumference, fat mass, FFM, and calf circumference decreased. PRD recommendations should be given for the care of appropriate older patients.

Keywords: Aged, malnutrition, body composition, program, nutrition therapy, proteins,

ÖZ

Amaç: Bu çalışmada; proteinden zengin beslenme (PZB) programının malnütrisyon riski (MR) altındaki yaşlı hastalarda vücut kompozisyonuna etkisinin araştırılması amaçlanmıştır.

Gereç ve Yöntem: İç Hastalıkları Diyet polikliniğine başvuran, kognitif sorunları, diyabeti ve renal hastalığı olmayan ≥65 yaş bireyler taranarak, çalışmaya normal nütrisyonel durum (ND)'da 30 yaşlı, MR altında 30 yaşlı alınması planlandı. Vücut kompozisyonu, ND, antropometrik değerlendirmeler yapıldı. Malnütrisyon riski altındaki bireylere PZB programı eğitimi verildi. İki aylık program sonrasında tüm değerlendirmeler her iki grupta tekrarlandı.

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Bulgular: *Çalışmaya 60 yaşlı dahil edildi (yaş ortalaması 72,5 ± 6,2; Kadın / Erkek: %63,3 / %36,7). İkinci ay sonunda MR altındaki grupta (n = 30): ortalama vücut yağ oranı azalmış (P = 0,036), total vücut suyu ve Mini Nütrisyonel Değerlendirme Kısa Form (MND – KF) skoru artmış bulundu (P = 0,020 ve P < 0,001). Ortalama vücut ağırlığı (VA), vücut kitle indeksi (VKİ), bel - kalça çevresi, yağ kütlesi, yağsız vücut kitlesi (FFM) ve baldır çevresi ölçümleri ise benzer bulundu. Normal ND'daki grupta (n = 30) ölçülen ortalama VA, bel - kalça çevresi, yağ kütlesi, FFM, ve baldır çevresi ölçümlerinde anlamlı düşüş gözlenirken (sırasıyla; P = 0,001, P = 0,021, P = 0,016, P = 0,025, P = 0,002, P = 0,017), VKİ, yağ yüzdesi, toplam vücut suyu ve MND-KF skorları iki ölçümde benzerdi.*

Sonuç: *PZB önerilen MR altındaki yaşlılarda ND düzelirken, yağ oranı azalmıştır. Normal ND'daki genel öneriler verilen yaşlılarda ise VA, bel - kalça çevresi, yağ kütlesi, FFM, ve baldır çevresi ölçümlerinde anlamlı düşüş gözlenmiştir. İleri yaştaki hastaların bakımında uygun hastalarda PZB önerileri yapılmalıdır.*

Anahtar Sözcükler: *Yaşlı, malnütrisyon, vücut kompozisyonu, program, beslenme tedavisi, protein.*

INTRODUCTION

Undernutrition is a substantial problem for older people. Various factors such as physiological changes, increasing comorbidities that develop with advancing age, polypharmacy, environmental and socio-economic factors, functional losses increase the risk of malnutrition. Many kinds of nutritional problems may occur at an older age, and a diet poor in protein is of particular importance (1, 2). Inadequate food intake may be characterized by muscle and weight loss. A diet low in protein contributes to those losses. Low protein consumption leads to consequences such as sarcopenia and weakness, impairing the quality of life in older people and causing increased morbidity and mortality. It has been shown that nutritional supplements rich in protein provide improvement in muscle quality, muscle strength, and functions in malnourished sarcopenic older patients (3). However, the effect of protein-rich dietary (PRD) recommendations on the body composition of older malnourished patients has not yet been clearly elucidated. It is also important to reveal the consequences of dietary and lifestyle changes regarding the quality of life and health.

So, we aimed to evaluate the nutritional status and body composition of older individuals and to provide PRD recommendations and training for appropriate older patients at risk of malnutrition to be re-evaluated after eight weeks, thus investigating the effect of PRD recommendations on the body composition of older patients at risk of malnutrition.

MATERIAL AND METHODS

Study population

Patients aged 65 and over whom applied to Internal Medicine Department Outpatient Clinic and referred to Internal Medicine Clinical Nutrition Outpatient Clinic were enrolled in the study consecutively within two months. Inclusion criteria in the study; Patients aged 65 and over and volunteered to participate in the study were enrolled. Exclusion criteria were as follows; patients with cognitive dysfunction (defined dementia or registered Mini - Mental Assessment Test <24), patients younger than 65 years of age, diabetic patients, and patients with renal diseases (defined chronic kidney disease, glomerular filtration rate <60 ml / min / 1.73 m^2, dialysis patients). It was planned to enroll 30 older patients in normal nutritional status and 30 older patients at malnutrition risk. Informed consent was obtained from all of the patients. This study was conducted in accordance with the Helsinki declaration, and approval from Ege University Medical Research Ethics Committee was obtained (Ethics committee decision no: 12-3.1 / 6).

Nutritional Assessment

Mini Nutritional Assessment - Short Form (MNA - SF) was applied to assess the nutritional status of the patients by the same dietician to all patients on their first visit. This test is used both as a screening tool and an evaluation method, and its sensitivity has been proven in older individuals. It includes anthropometric measurements, and questions about the health status of the person. In the MNA, normal nutritional status is diagnosed with a score of 24 and above (4, 5). In MNA - SF, the patient is at malnutrition risk when the score is ≤11. Scores between 12 - 14 points indicate normal nutritional status. In recent years, scores between 8 and 11 have been scored as at risk, and between 0 and 7 as malnutrition. However, in this study, patients

were examined in two categories as malnutrition risk and normal nutritional status, and individuals with an MNA - SF score ≤11 were grouped as at risk of malnutrition.

Body composition, socio-demographic – anthropometric assessments

The socio-demographic data, comorbidities, and medication of the older patients were evaluated with a questionnaire. Comorbidities were noted as diabetes, chronic kidney disease, dialysis, and other conditions (other possible problems present in the patient) and classified as yes / no. Medication use was noted as yes / no, and all individuals using at least one regular medication were classified as "medication use", regardless of the number of medications used. Anthropometric measurements (waist circumference, hip circumference, body mass index (BMI)) were performed. Body composition was evaluated using a bioelectrical impedance analyzer (BIA) (BC - 418 MA Segmental Tanita). Fat mass (kg), fat percentage (%), fat free mass (FFM) (kg) measurements were evaluated.

Protein-rich nutritional regime

Protein-rich dietary regime training was given to 30 patients who were found to be at risk of malnutrition after nutritional evaluation by the same dietitian. Protein-rich dietary recommendations containing 25 - 35 kcal / kg / day, and 1.2 - 1.5 g / kg / day protein were given as a medical nutritional program. Practical examples were explained. At the end of one month, 30 patients at risk of malnutrition were called by phone, and suggestions were made for their compliance with the program. The other group with normal nutritional status were given general healthy nutritional recommendations.

After the implementation of a two-month medical nutrition program; nutritional, anthropometric evaluations and body composition analysis measurements were repeated in both groups.

Statistical analyses

SPSS 19.0 (SPSS Inc., Chicago, IL, USA) program was used for the statistical analysis of the data. The Shapiro-Wilk test was used to examine the distribution of the data. Numerical variables were given as mean ± SD. The differences between the PRD group and the control group at the first and second follow-up after two months were investigated by Paired t-test. $P <0.05$ was considered significant.

RESULTS

Among the 378 patients screened; patients with cognitive dysfunction (n = 20), patients under 65 years of age (n = 150), diabetes (n = 100) and renal diseases (n = 48) were excluded from the study. Sixty patients who met the inclusion criteria and did not present the features of the exclusion criteria were included in the study [normal nutritional status (n = 30), malnutrition risk (n = 30)]. Of the 60 patients included (mean age 72.5 ± 6.2); 38 of them were females (63.3%) and 22 of them were males (36.7%). Sociodemographic, anthropometric, nutritional data, body composition parameters, and medical history of the whole group are shown in Table-1.

General healthy dietary recommendations were given to patients with normal nutritional status. In this group, a significant decrease was observed in the mean body weight, waist circumference, hip circumference, fat mass, fat free mass and calf circumference measurements at the end of the second month (respectively; P = 0.001, P = 0.021, P = 0.016, P = 0.025, P = 0.002, P = 0.017). Body mass index, percentage of fat, total body water, and MNA - SF scores were similar in the two measurements. The initial evaluation and the second evaluation data of patients with normal nutritional status are shown in Table-2.

Protein-rich nutritional training was given to patients at risk of malnutrition. At the end of the second month; the mean body fat ratio decreased (P = 0.036) where total body water and MNA - SF score were found to be increased (P = 0.020 and P <0.001). There was no statistically significant difference in body weight, BMI, waist circumference, hip circumference, fat mass, FFM, and calf circumference measurements. The data of the initial evaluation and the second evaluation for the group at risk of malnutrition which was given a PRD program are shown in Table-3.

Table-1. Sociodemografic, nutritional, anthropometric, medical and body composition data in the total group in the initial assessment.

Parameters	Total group (n = 60)
Age (year)	72.5 ± 6.2 (65 - 89)
Sex (Female / Male), n (%)	38 (63.3) / 22 (36.7)
Comorbidities (yes), n (%)	49 (81.7)
Female / Male, n (%)	34 (89.5) / 15 (68.2)
Medication (yes), n (%)	49 (81.7)
Female / Male, n (%)	34 (89.5) / 15 (68.2)
Body mass index (kg/m^2)	28.6 ± 6.8
Waist circumference (cm)	95.4 ± 13.4
Hip circumference (cm)	105.6 ± 9.3
Calf circumference	36.4 ± 3.8
Fat mass (kg)	24.4 ± 9.5
Fat ratio (%)	33.6 ± 9.2
FFM (kg)	46.9 ± 10.4
Total body water (kg)	34.5 ± 7.6
MNA-SFscore	11.4 ± 2.6

MNA - SF: Mini Nutritional Assessment Short Form, FFM: fat free mass.

Table-2. Sociodemografic, nutritional, anthropometric, medical and body composition data in the normal nutritional status group in the initial and the second assessments.

Parameters	Initial assessment (*n* = 30)	Second assessment (*n* = 30)	p
Age (year)	71 ± 5.9 (65 – 88)	-	-
Female / Male, n (%)	17 (56.7) /13 (43.3)	-	-
Comobidities (yes), n (%)	24 (80)	-	-
Medication (yes), n (%)	24 (80)	-	-
Weight (kg)	78.1 ± 4.7	76.9 ± 13.8	**0.001**
BMI (kg/m^2)	31 ± 7.7	29.5 ± 4.9	NS
Waist circumference (cm)	98.7 ± 13.4	97.7 ± 12.9	**0.021**
Hip circumference (cm)	109.7 ± 8.9	109.1 ± 8.7	**0.016**
Calf circumference (cm)	38.1 ± 3.9	37.9 ± 4.0	**0.017**
Fat mass (kg)	27.5 ± 9.4	26.8 ± 8.5	**0.025**
Fat ratio (%)	34.8 ± 8.1	33.6 ± 9.1	NS
FFM (kg)	50.6 ± 9.7	50.1 ± 9.7	**0.002**
Total body water (kg)	37.1 ± 7.2	37.1 ± 7.0	NS
MNA - SF score	12.9 ± 0.4	12.6 ± 1.4	NS

MNA – SF, Mini Nutritional Assessment Short Form; FFM, fat free mass; BMI, body mass index.

Table-3. Sociodemografic, nutritional, anthropometric, medical and body composition data in malnutrition risk group in the initial and the second assessments.

Parameters	Initial assessment (*n* = 30)	Second assessment (*n* = 30)	p
Age (year)	73.7± 6.2 (65 - 89)	-	-
Female / Male, n (%)	21 (70) / 9 (30)	-	-
Comorbidities (yes), n (%)	25 (83.3)	-	-
Medication (yes), n (%)	25 (83.3)	-	-
Weight (kg)	64.8 ± 13.2	65.5 ± 12.9	0.054
BMI (kg/m^2)	26.1 ± 4.6	26.4 ± 4.4	0.066
Waist circumference (cm)	92.1 ± 12.8	93 ± 13	0.098
Hip circumference (cm)	101.6 ± 7.9	102 ± 8.1	0.272
Calf circumference (cm)	34.7 ± 2.9	34.7 ± 2.7	0.859
Fat mass (kg)	21.2 ± 8.6	20.8 ± 8	0.194
Fat ratio (%)	32.5 ± 10.1	31.6 ± 9.4	**0.036**
FFM (kg)	43.2 ± 9.8	43.9 ± 10	0.158
Total body water (kg)	31.6 ± 7.1	32.5 ± 7	**0.020**
MNA – SF score	9.8 ± 2.6	11.7 ± 2.1	**<0.001**

MNA – SF, Mini Nutritional Assessment Short Form; FFM, fat free mass; BMI, body mass index.

DISCUSSION

In this study which "investigates" the impact of the PRD program on body composition in older patients at malnutrition risk, nutritional status improved after two months of the program. Also, the average body fat ratio decreased and total body water increased. In the normal nutritional status group for whom general nutritional recommendations were given, a significant decrease was observed in mean weight, waist-hip circumference, fat mass, FFM, and calf circumference measurements.

Physiological changes in older persons increase the risk of undernutrition. Besides, present comorbidities and various medications, and polypharmacy increase this risk. The frequency of chronic diseases also increases in older ages (6, 7). It has been found that 84.7% of older persons have at least one chronic disease (8). Similarly, in our study, comorbid diseases were present in 83.3% of the risky group for malnutrition, and 80% of the normal nutritional status group. Similarly, all patients with chronic diseases were using at least one medication regularly. Female patients are shown to be at a higher risk of malnutrition than men (9, 10). Consistent with the literature, 70% of the group at risk of malnutrition, and 56.7% of the group with

normal nutritional status were females. Female patients were 63.3% of the entire group. As the study population consisted of mainly female patients, this might have led to this result. It might also be assumed that female patients apply to the diet outpatient clinic more than men.

Morbidity and mortality are higher in older individuals with malnutrition (11-13). Body composition changes play an important role in increased mortality and functional decline in the elderly. Sarcopenia which is characterized by decreases in muscle mass and functions is more common in individuals with malnutrition (14). Though physiological factors such as gender, aging, and increased protein need are important in the sarcopenia process, there are intervention areas such as insufficient protein consumption, vitamin D levels, and physical activity like resistance exercises (1, 2)."

Older people with coronary artery disease, and diabetes mellitus, even older people who think that they should not consume protein because they are elderly only, may reduce their protein consumption. Therefore, a diet poor in protein is an issue that needs particular attention in the elderly, and strategies that preserve protein content in the diet are areas to be investigated (15-17). In a study by Bouillanne et al., it has been reported that pulse protein nutrition

presented a positive effect on FFM mass in hospitalized patients with malnutrition and at risk of malnutrition (18). Arnal et al. showed that intense protein nutrition increases protein synthesis in the elderly (19). In another study, the inclusion of protein-enriched bread and yogurt drinks in regular meals was associated with better clinical outcomes in individuals with acute illness (20). In a recent multicenter, randomized controlled, double-blind study, 330 elderly patients with malnutrition and sarcopenia were given two different oral nutritional supplements for 24 weeks containing different protein and other ingredients, and the results were compared. Products contained similar calories and were prescribed for one group with 14 grams of protein and 147 IU of vitamin D, and the other with 20 grams of protein, 499 IU vitamin D, and 1.5 grams of calcium beta-hydroxy beta-methyl butyrate (3). Muscle mass, strength, quality, and functions were investigated at the beginning and the end of 24 weeks. In both groups, muscle quality, muscle strength, and functions showed similar improvement. The authors reported that oral nutritional supplements improved muscle strength in sarcopenic and malnourished patients. Besides, it was reported that treatment with a higher protein, vitamin D, and calcium beta - hydroxy beta – methyl butyrate provided additional benefits in improving leg muscle strength and quality in mild to moderate sarcopenic patients (3). In another study investigating two groups, one group was recommended to consume ricotta cheese (210 g / day) and the other group continued a daily routine diet. At the end of 12 weeks, an improvement in muscle mass and balance scores and a decrease in muscle strength loss was reported (21). Though it has been reported that nutritional interventions in malnourished and sarcopenic individuals may improve muscle outcomes in such studies in recent years, in a recently published review; it has been reported that exercise training is the most effective method for sarcopenia, and nutritional and drug interventions are ineffective or do not show promising synergistic effects in addition to exercise (3, 22). The impact of dietary recommendations on body composition, especially FFM, muscle mass, and function, by only itself in malnourished elderly patients is not clearly revealed to date. To the best of our knowledge, there is no study on this subject.

In our study, the PRD recommendation intervention for older persons at risk of malnutrition improved nutritional status,

decreased body fat percentage and increased total body water. Though not statistically significant, there was an increase in FFM values. The reason for this insignificant result might be the small size of the study group and the short follow-up period. As nutritional status improved, body fat percentage decreased. Evaluating those data together with the non-significant increase in FFM and the increase in total body water; it may be hypothesized that this result is due to the positive effect of PRD recommendations on body composition and possibly muscle parameters.

In the group with normal nutritional status, a significant decrease in FFM and an overall decrease in nutritional parameters were observed. This situation may have occurred due to the causes of admissions to the hospital. However, since the comorbidities of the patients in this study were only noted as presence / absence of comorbidity, we could not demonstrate the disease effect on these results. Our small study population may also have affected those results.

Our cross-sectional study design is a limitation as it does not reveal the cause - effect relationship. Besides, both groups were evaluated within their groups. The differences among those groups in terms of nutritional status, gender, age, and BMI are the weaknesses of our study. Physical activity has an important contribution to lean body mass. However, physical activity was not evaluated in our study. In this study, we did not use predicted segmental muscle mass values. We preferred to use total FFM values measured and directly reported by the BIA model we used. On the other hand, the strength of our study is that it is a pioneering study investigating body composition changes by applying only PRD recommendation intervention in older outpatients at risk of malnutrition. Our study should be evaluated considering those limitations and strengths.

CONCLUSION

The nutritional status improved and the fat ratio decreased in older persons at risk of malnutrition for whom a protein-rich diet was recommended. In older persons who were given general recommendations in normal nutritional status, a significant decrease was observed in nutritional data and FFM measurements in general. In the care of older patients, PRD recommendations should be made in suitable patients.

Future perspectives

Further randomized controlled studies are needed to investigate the early and long-term effects of nutrition with high protein content for older individuals who are malnourished or at risk of malnutrition.

Conflict of interest

None declared.

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Sarcopenia prevalence and the quality of life in older adults: A study from Turkey's east

Yaşlı yetişkinlerde sarkopeni prevalansı ve yaşam kalitesi: Türkiye'nin doğusundan bir araştırma

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ABSTRACT

Aim: Sarcopenia as a geriatric syndrome decreases quality of life and increases functional dependency, hospitalization and mortality. The aim of this study is to investigate the prevalence of sarcopenia among community-dwelling people aged 65 years and older in Muş province and to examine its effects on quality of life.

Materials and Methods: In this study we have interviewed 371 community-dwelling older adults. A total of 186 older adults from the rural area and 185 older adults from Muş city center were enrolled in the study. Data was collected through face-to-face interviews conducted in the participants' homes by trained researchers. The presence of sarcopenia, socio-demographic characteristics (place of residence, gender, age), presence of chronic diseases, polypharmacy, body mass index, and quality of life with Short Form-36 were determined. Muscle mass, handgrip strength and gait speed were determined for defining sarcopenia.

Results: The mean age of participants was 72.3 ± 6.8 years (65-100) and 46.1% of them were females. The prevalence of sarcopenia was 11.8% among older people residing in the rural area whereas the prevalence was 21.6% among older individuals living in the city center (p = 0.012). Sarcopenic patients were older, more underweight, hypertensive, and had lower calf circumference, gait speed, and grip strength in males than non-sarcopenic patients (p <0.0001, p <0.0001, p = 0.005, p <0.0001, p = 0.001, p <0.0001, respectively). There were important distinction between sarcopenic individuals and non-sarcopenic individuals in terms of physical function, physical role weakness and emotional role weakness (p = 0.021, p = 0.006 and p = 0.009, respectively).

Conclusion: Sarcopenia is very common among older adults, especially in the city center, and the presence of sarcopenia has detrimental effects on the quality of life.

Keywords: Aged, sarcopenia, quality of life, prevalence.

ÖZ

Amaç: Sarkopeni; yaşam kalitesini düşüren, fonksiyonel bağımlılığı, mortaliteyi ve hastaneye yatış oranını artıran bir geriatrik sendromdur. Bu çalışma, Muş ilinde toplumda yaşayan 65 yaş ve üzeri yetişkinlerde sarkopeni prevalansını değerlendirmeyi ve yaşam kalitesi üzerindeki etkilerini incelemeyi amaçlamaktadır.

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Gereç ve Yöntem: *Bu çalışmada, Muş ilinde toplumda yaşayan toplam 371 katılımcıyla görüşüldü. Çalışmaya katılan yaşlı yetişkinlerin 186'sı Muş ilinin kırsal kesiminden, 185'i il merkezinde yaşamaktaydı. Veriler, katılımcıların evlerinde deneyimli araştırmacılar tarafından yüz yüze görüşme tekniğiyle toplanmıştır. Katılımcılarda sarkopeni varlığı, sosyo-demografik özellikler (yaş, cinsiyet, yaşadığı yer), kronik hastalık varlığı, polifarmasi, vücut kitle indeksi ve SF-36 yaşam kalitesi ölçeği ile yaşam kalitesi değerlendirilmiştir. Sarkopeniyi tanımlamak için yürüyüş hızı, el kavrama gücü ve baldır çevresine göre kas kütlesi belirlenmiştir.*

Bulgular: *Katılımcıların yaş ortalaması 72,3 ± 6,8 yıl (65-100) ve %46,1'i kadındı. Kırsal alanda yaşayan yaşlı yetişkinlerde sarkopeni prevalansı %11,8 iken, şehir merkezinde yaşayanlarda %21,6 idi (p = 0,012). Erkek katılımcılardan sarkopenik olanlar, sarkopenik olmayanlara göre daha yaşlı, daha zayıf, hipertansif ve daha düşük baldır çevresi, yürüme hızı ve kavrama gücüne sahipti (sırasıyla, p <0,0001, p <0,0001, p = 0,005, p <0,0001, p = 0,001, p <0,0001). Sarkopenik bireyler ile sarkopenik olmayan bireyler arasında fiziksel işlev, fiziksel rol zayıflığı ve duygusal rol zayıflığı açısından anlamlı farklılıklar saptandı (sırasıyla, p = 0,021, p = 0,006 ve p = 0,009).*

Sonuç: *Sarkopeni, özellikle şehir merkezinde yaşayan yaşlı yetişkinler arasında daha sık görülmüştür ve sarkopeni varlığının yaşam kalitesi üzerinde olumsuz etkileri vardır.*

Anahtar Sözcükler: *Yaşlı, sarkopeni, yaşam kalitesi, prevalans.*

INTRODUCTION

Old age is characterized by weakening of vital functions and as well as the loss of the ability to adapt to environmental factors (1). The population aged 65 years and older shows an increase of 5% per annum in both developed and developing countries (2-4). Sarcopenia is one of the most important geriatric syndromes and refers to a decrease in muscle mass, strength, functionality and performance depending on age (5-8). Thus, older individuals may become dependent on their activities of daily living (9). The quality of life is described as individuals' healthiness, as well as their effectiveness in physical, social and psychological aspects. It is also related to many elements of life such as benefiting from health and educational services, adequate nutrition and protection, participation in daily life, and respectfulness. Accordingly, physical activity and exercise have substantial impact on the quality of life (10). In recent years, there has been a consensus that instruments on quality of life should be multidimensional and include subjective characteristics. Many researchers proposed a comprehensive instrument for areas such as, social function, physical role, physical symptoms and psychological factors, cognitive function, body image and sexual function (11-13).

Considering sensitivity, reliability and validity to change among the scales evaluating the quality of life in people aged 60 and over, it was found that the Short Form-36 (SF-36), EuroQol-5 Dimension (EQ-5D) and Nottingham Health Profile scales are more sensitive (14-15). The SF-36 is recommended when there is a need to conduct a comprehensive estimation of the health-related quality of life (16). The aim of this study is to investigate the prevalence of sarcopenia and the impact of sarcopenia on the quality of life of older adults in our city.

MATERIALS AND METHODS

Study population and design

This cross-sectional research was performed in Muş province between January 2017 and March 2018. At the time of the study, the number of people aged 65 years and over living in the central district of Muş province was 10737, and the minimum sample size was 371 with a 5% margin of error and 95% confidence interval. The names and addresses of all individuals aged 65 and over were taken from local authorities, and individuals were selected by random. A total of 186 older adults from the rural area and 185 older adults from Muş city center were participated in the research. Elimination principle were diabetic foot, cognitive impairment, amputation of lower extremities, not able to walk or perform grip strength. Sociodemographic characteristics of the participants such as age, gender, place of residence and diseases diagnosed by a physician (e.g. hypertension, congestive heart failure, peripheral artery disease, cancer, diabetes mellitus, liver and renal failure) were recorded. The data were collected in the participants' residences using a questionnaire which was developed by the researchers in accordance with the variables. The interviewers

who collected the data were trained about the study in advance.

Anthropometric measurements

Individuals were weighed by a digital scale without shoes in light indoor clothes and the heights were measured by a meter fixed on the wall. The body-mass index (BMI) was obtained by dividing the weight (kg) by the square of the length (m^2). Accordingly, a BMI of <18.5 kg/m^2 was regarded as low BMI, 18.5-24.9 kg/m^2 as normal, 25-29.9 kg/m^2 as overweight, and ≥30 kg / m^2 as obese (17).

Sarcopenia evaluation

Sarcopenia was determined based on the diagnosis algorithm of European Working Group on Sarcopenia in Older People (EWGSOP) 2010 consensus (9). Muscle mass, grip strength and gait speed were determined for defining sarcopenia.

Gait speed was measured by using a stopwatch to measure participants' duration of walking for 6.0 meters. The interviewer identified the starting and ending points on a flat surface, ensured that the participant starts from the starting point, and started the time and ended it when the participant went beyond the ending point. The time during which the participant walked 6.0 meters was recorded in seconds. Gait speed of 1 m/s and slower was regarded as low walking speed (9,18).

Muscle strength was measured using the Takei T.K.K. digital handgrip dynamometer (Takei Scientific Instruments Co. Ltd, Tokyo, Japan). The highest of the three measured values were taken as the final strength of the dominant hand. The cutoff points in the EWGSOP 2010 consensus paper were used for muscle strength (9). Muscle strength of <30 kg for men and <20 kg for women was classified as low.

The muscle mass parameter was measured through the calf circumference measurements. While the participant was sitting with a leg curled up at 90 degrees, the circumference of the widest part of the calf was measured as parallel to the ground with a non-stretched measuring tape. Individuals with a calf circumference of 31 cm or lower were regarded as having low muscle mass (19). Based on this algorithm, the presence of low muscle mass alone indicates pre-sarcopenia, low muscle strength or low gait speed in addition to low muscle mass shows sarcopenia, and lastly low muscle strength plus low gait speed and low muscle mass demonstrates severe sarcopenia (9).

The quality of life

The SF-36 consists of 36 items, two primary dimensions, which are physical and mental, and eight sub-scales including physical function, physical role restriction, social function, emotional role restriction, energy, mental health, pain and general health perception (20). Turkish reliability and validity studies were conducted by Pınar in 1995 (21).

Statistical analyses

The data were analyzed using IBM SPSS 23.0. While reporting descriptive findings, the mean and standard deviations or medians (minimum-maximum) of the data obtained through the instruments were presented along with the grouped data frequency distributions where available. Chi-square was considered for the test of qualitative variables, while student-t test and Mann-Whitney U test were performed for quantitative variables and the significance level was accepted as p<0.05.

RESULTS

A total of 191 participants living in the city center and 188 individuals from rural area, 379 individuals in total were contained in the study. Eight participants with the elimination criteria were eliminated from the inquiry. Finally, 371 participants were contained in the analysis. The mean age of the participants was 72.3 ± 6.8 years (65-100). According to BMI, 124 participants (33.4%) were obese and 130 participants (35%) were overweight. Among the participants, 330 of them (89.9%) had at least one chronic disease and 275 participants (74.1%) used at least one drug continuously. The most common chronic diseases were hypertension (51.5%), diabetes mellitus (21.3%) and congestive heart failure (12.9%). Peripheral artery disease (2.2%), cancer (1.4%), liver failure (2.4%) and renal failure (4.9%) diagnoses were detected only in a few patients, so those diagnoses were not contained in the investigations.

Characteristics of the participants in relation to the presence of sarcopenia are given in Table-1. The pervasiveness of sarcopenia was found to increase particularly with age (p <0.0001). The pervasiveness of sarcopenia was higher among older individuals living in the city center than in the rural area (p = 0.012). Sarcopenic patients

were more underweight, hypertensive, and had lower calf circumference, gait speed and grip strength in males (Table-1). No other significant relationship was found between sarcopenia and in terms of gender, diabetes mellitus, congestive heart failure, the number of drugs, and muscle strength in females as shown in Table-1.

The relationship between the presence of sarcopenia and the subscales of the SF-36 quality of life scale is given in Table-2. Median physical functional scores of non-sarcopenic patients were significantly higher than sarcopenic patients (p = 0.021). There were obvious distinction between sarcopenic individuals and non-sarcopenic individuals in terms of role limitation (physical) and role limitation (emotional) (p = 0.006 and p = 0.009) (Table-2).

Table-1. Characteristics of the participants in relation to sarcopenia.

Characteristics		Total (n = 371)	Sarcopenic (n = 62)	Non-sarcopenic (n = 309)	p
Age group, years, n (%)	65-74	248 (66.8)	27 (10.9)	221 (89.1)	**< 0.0001***
	75-84	96 (25.9)	21 (21.9)	75 (78.1)	
	85+	27 (7.3)	14 (51.9)	13 (48.1)	
Gender, n (%)	Female	171 (46.1)	30 (17.5)	141 (82.5)	0.780*
	Male	200 (53.9)	32 (16.0)	168 (84.0)	
Residence address, n (%)	Rural	186	22 (11.8)	164 (88.2)	**0.012***
	City center	185	40 (21.6)	145 (78.4)	
Chronic diseases, n (%)	HT	191 (51.5)	42 (22.0)	149 (78.0)	**0.005***
	DM	79 (21.3)	12 (15.2)	67 (84.8)	0.737*
	CHF	48 (12.9)	10 (20.8)	38 (79.2)	0.410*
Number of medications, n (%)	0	96 (25.9)	16 (16.7)	80 (83.3)	0.816*
	1-2	148 (39.9)	23 (15.5)	125 (84.5)	
	3-4	90 (24.3)	16 (17.8)	74 (82.2)	
	5-6	27 (7.3)	4 (14.8)	23 (85.2)	
	7 and above	10 (2.7)	3 (30.0)	7 (70.0)	
Body composition, n (%)	Underweight	8 (2.2)	6 (75.0)	2 (25.0)	**< 0.0001***
	Normal	109 (29.4)	37 (33.9)	72 (66.1)	
	Overweight	130 (35)	18 (13.8)	112 (86.2)	
	Obese	124 (33.4)	1 (0.8)	123 (99.2)	
CC (cm)[†]		35.1 ± 5.2	28.2 ± 2.3	36.5 ± 4.5	**< 0.0001****
Grip strength (kg)[†]	Female	15.6 ± 5.6	14.8 ± 5.2	15.8 ± 5.7	0.368**
	Male	30.8 ± 10.4	23.46 ± 9.9	32.2 ± 9.9	**< 0.0001****
Gait speed (m/sn)[†]		0.8 ± 0.3	0.7 ± 0.2	0.8 ± 0.3	**0.001****
Low CC, n (%)		67 (18.0)	61 (91.04)	6 (8.95)	**< 0.0001***
Slow gait speed, n (%)		241 (64.9)	51 (21.1)	190 (78.8)	**0.002***
Low grip strength, n (%)	Female	135 (78.9)	24 (17.7)	111 (82.2)	1.000*
	Male	85 (42.5)	23 (27.1)	62 (72.9)	**< 0.0001***

HT, hypertension; BMI, body mass index; CHF, congestive heart failure; DM, diabetes mellitus; CC, calf circumference. [†]Values are given as mean ±standard deviations; * Pearson Chi Square Test; ** Mann Whitney-U Test.

Table-2. Effects of sarcopenia on quality of life according to SF-36 scale.

Variables	Sarcopenic (n = 62)	Non-Sarcopenic (n = 309)	p
Physical functioning[††]	30 (0-100)	40 (0-100)	**0.021***
Role limitation-physical[†]	16.1 ± 32.6	26.1 ± 35.4	**0.006***
Role limitation- emotional[†]	16.6 ± 32.3	29.3 ± 38.7	**0.009***
Vitality[††]	40 (0-100)	45 (0-100)	0.074*
Mental health[††]	56 (16-100)	56 (0-100)	0.562*
Social functioning[††]	50 (0-100)	63 (0-100)	0.286*
Bodily pain[††]	45 (0-100)	45 (0-100)	0.775*
General health perception[††]	35 (0-100)	40 (0-100)	0.051*

[†]Values are given as mean ± standard deviations; [††]Values are given as medians (minimum-maximum); [*]Mann Whitney-U Test.

DISCUSSION

In the scope of this study, 171 female (46.1%) and 200 male (53.9%) with a mean age of 72.2 ± 6.7 years, a total of 371 individuals aged 65 years and over were interviewed. Their sociodemographic characteristics, chronic disease status, multiple drug use, BMI, presence of sarcopenia and quality of life were examined. Subsequently, the relationship between the quality of life and sarcopenia was investigated. Prevalence of sarcopenia is 5-13% in adults aged 60 to 70 years, and 11-50% in adults the age of 80 and over (22). In a study conducted in Belgium, the prevalence of sarcopenia was found to be 8.4-27.6% in 250 individuals aged 65 years and over who applied for outpatient care in a geriatric clinic (23). In Brazil, the prevalence was found to be 6.1-36.6% in 132 individuals aged 60 years or older by using different criteria (24). In a study conducted according to EWGSOP criteria in Japan, the prevalence of sarcopenia was found to be 7.5% in 5104 individuals aged 65 years and older (25). The prevalence of sarcopenia in all older participants was 16.7% in this study. By advancing age, sarcopenia prevalence increased in our study in accordance with the literature (26-28).

This study has a different characteristic compared to the literature in terms of including participants from both rural and urban areas. The frequency of sarcopenia showed a statistically obvious distinction between individuals living in the two regions. The prevalence of sarcopenia was 11.8% in individuals living in rural areas, and

21.6% in those living in urban areas. Older people living in the rural areas are more active using body muscles at their work, and individuals living in the urban areas may have less physical activity, less exposure to sun, and a diet high in fats and refined carbohydrates. So, the lower sarcopenia prevalence in the rural areas might have resulted from this situation. In accordance with our study, another study involving 205 Brazilian community-dwelling older adults, the pervasiveness of sarcopenia was significantly higher in women living in urban areas than in the rural group (29). In another study, the pervasiveness of sarcopenia was significantly higher in urban areas than in the rural areas (30). Unlike our study, in a recent study from China; sarcopenia was higher in community-dwelling elderly in rural areas (31). That finding may be explained with two facts. First, rural elders in that study suffered from malnutrition or were at risk for malnutrition, which may cause sarcopenia. Second, fewer rural elders performed physical activity than urban elders in that study; therefore, they were more sarcopenic than urban elders. In addition, more rural adults were suffering from osteoarthritis, which could significantly affect normal walking speed (32).

There are studies showing the relationship between hypertension and the presence of sarcopenia. According to a study in Japan, the frequency of hypertension increased the incidence of sarcopenia. In this study, the most common disease among participants was hypertension, and it was revealed that there was a significant relationship with sarcopenia (33).

The present study revealed a correlation between low BMI and sarcopenia. In several studies, the participants with sarcopenia had lower BMIs similar to our study (31, 31-38). In another study, higher BMI was found as a risk factor for sarcopenia, which was different from our study (30).

We realized a obvious distinction statistically in the quality of life scores between sarcopenic and non-sarcopenic individuals. In our results, the scores were significantly lower in sarcopenic individuals, especially in the physical functioning subscale. The results of our study were similar to the study by Beaudart et al. (38) with 534 individuals over the age of 65 years. In this study, the authors reported that sarcopenia was particularly influential on poor physical function scores with SF-36-measured quality of life. In another study conducted with 2987 people between the ages of 59-73 by using the SF-36 scale, low hand grip values were related to poor physical health and poor general health perception in men, and in addition to these two domains, significant relationships of physical role difficulties, pain and vitality in women have been revealed (39). In a study conducted with 1397 male individuals aged 50 and over in Korea, the EQ-5D scale was used to measure the quality of life, and a significant relationship was found between sarcopenia and mobility problems and daily living activities (40). Patel et al. (41) reported reduced quality of life scores in sarcopenic patients living in the UK. Sarcopenic individuals had poor self-reported functional domains and general health scores. In our study, a significant relationship was found between sarcopenia and physical functioning score. Kull et al. (42) showed lessened quality of life scores in two areas (i.e. vitality and physical function) of the SF-36 survey in sarcopenic content. Our study showed lower scores in the physical functioning, role-physical, and role-emotional subscales of the SF-36 questionnaire.

There were some limitations of our study. First, we did not use the revised EWGSOP criteria (43), as we preferred to use calf circumference measurement for muscle mass. We did not use Turkish thresholds for calf circumference suggested by Bahat et al. (44) either, because of the limited source of studies using local thresholds for calf circumference. Additionally, especially for obese patients, the value of calf circumference for determining muscle mass is not clear (45, 46). However in the region that we performed the study, our resources were available for the relevant assessment method. Besides, the Sarcopenia and Quality of Life tool (47) was not applied in this study as another limitation. On the other hand, our study is the first study investigating sarcopenia and health quality in our region reflecting the characteristics of an eastern city of Turkey which may lead future studies following the present study. Our study needs to be evaluated considering those limitations and strengths.

CONCLUSION

According to the findings of the present study, the prevalence of sarcopenia was 16.7% among overall, 17.5% in women and 16% in men. The pervasiveness of sarcopenia raised majorly with increasing age. Sarcopenia adversely affected the quality of life in terms of physical functioning, physical and emotional limitations. The rate of sarcopenia in rural areas was lower than in urban centers. Lower BMI values increased the risk of sarcopenia. The diagnosis of sarcopenia, which is associated with mortality, morbidity, physical dependence and low quality of life in the elderly, is of great importance. Sarcopenia that arises as a natural result of aging may accelerate with sedentary life habits. In this context, the sarcopenia process can be slowed down with programs aiming at increasing physical activity in the elderly, especially those living in urban areas. At this point, it is necessary for health professionals to motivate the elderly, and for local authorities to ensure an active life for them and provide a sustainable environment and further studies are required to explore the specific causative factors in this context.

Ethical standards

The research protocol was approved by the local ethics committee of Muş Alparslan University on June 29, 2016 (Approval Number: 29/06/2016-03-04). Each participant was informed about the study and signed a consent form.

Conflict of interest

The authors declare that they have no conflict of interest.

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Association of muscle strength and muscle mass with body mass index and insulin treatment in older patients with type 2 diabetes mellitus admitted to geriatric outpatient clinic

Geriatri polikliniğine başvuran tip 2 diabetes mellituslu hastalarda kas gücü
ve kas kütlesinin vücut kitle indeksi ve insülin tedavisiyle ilişkisi

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ABSTRACT

Aim: The aim of this study was to investigate the hand grip strength and muscle mass of older patients with type 2 diabetes mellitus in relation to body mass index and insulin treatment.

Materials and Methods: A total of 123 older patients with diabetes mellitus ≥65 years of age were admitted to geriatric outpatient clinic of a university hospital between October 2015 and October 2019. Demographic data, medical records, laboratory results, hand grip strength and muscle mass were derived from the hospital records, retrospectively.

Results: The patients were grouped according to body mass index and usage of insulin treatment. There was a negative correlation between body mass index and hand grip strength (p = 0,002), and a positive correlation between body mass index and muscle mass index (p = 0,001). No significant differences for hand grip strength and muscle mass index were observed between insulin treatment group and non-insulin treatment group.

Conclusion: In type 2 diabetes mellitus patients with normal weight and obesity, anthropometric differences should be considered to identify true sarcopenic patients. Assessment of muscle strength, and also evaluation of muscle quality might be more valuable than assessment of muscle mass for those patients.

Keywords: Elderly, muscle strength, muscle mass, diabetes mellitus, insulin treatment.

ÖZ

Giriş: Bu çalışmanın amacı, 65 yaş üstü diabetes mellituslu hastaların kas gücü ve kas kütlesinin vücut kitle indeksi ve insülin tedavisi ile ilişkisini araştırmaktır.

Gereç ve Yöntem: Çalışmaya Ekim 2015 – Ekim 2019 tarihleri arasında bir üniversite hastanesi Geriatri polikliniğine başvurmuş 65 yaş ve üzeri 123 diabetes mellituslu hasta dahil edilmiştir. Demografik bilgiler, tıbbi kayıtlar, laboratuvar sonuçları, el sıkma gücü, kas kütlesi ölçümleri hastane kayıtlarından retrospektif olarak kaydedilmiştir.

Bulgular: Hastalar, insülin kullanımına ve vücut kitle indeksine göre gruplandırıldı. Hastaların vücut kitle indeksi ve el sıkma güçleri arasında negatif bir korelasyon (p = 0,002), vücut kitle indeksi ile kas kütle indeksi arasında ise pozitif bir korelasyon saptandı (p = 0,001). İnsülin kullanan ve kullanmayan hastaların el sıkma gücü ve kas kütlesi ölçümleri arasında ise anlamlı fark saptanmadı.

Sonuç: Normal kilolu ve obez diabetes mellituslu hastalar arasında, gerçek sarkopenik hastaları tespit etmek için, antropometrik farklılıklar göz önünde tutulmalıdır. Bu hastalarda kas kütlesinin değerlendirilmesinden çok, kas gücü ve hatta kas kalitesinin değerlendirilmesi daha faydalı olabilir.

Anahtar Sözcükler: Yaşlı, kas gücü, kas kütlesi, diabetes mellitus, insülin tedavisi.

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INTRODUCTION

Diabetes mellitus (DM) is a metabolic disease that negatively impacts the quality of life in old age (1). Changes occur in body composition with aging, and these changes also appear to affect insulin secretion. Thus, advanced age is an important risk factor for the developing type 2 DM (2). In addition, DM is one of the most important reasons for muscle weakness (3, 4). Diabetes mellitus negatively affects muscle function and functional status in older adults. A study found that older adults with DM have lower muscle strength than those without DM (5).

Insulin has an anabolic effect on muscle tissue by increasing intracellular protein intake (6), and insulin treatment could positively affect muscle function and functional status due to its anabolic effect (7). Poor glycemic control and insulin resistance are associated with reduced muscle mass in older adults with DM (8). Lower endogenous insulin secretion contributes to the loss of muscle mass in DM patients (8).

In another study, Insulin treatment was shown to affect gait speed, but not muscle mass and muscle strength (9). It is reported that body mass index (BMI) would also have an impact on muscle mass and muscle strength (10, 11).

The association of the muscle strength and mass with insulin treatment and BMI is not well known. In this study, the association of the muscle strength and mass with insulin treatment and BMI was investigated in older adults with DM.

MATERIALS AND METHODS

Study Population

In this study, patients aged 65 years and over admitted to the geriatric outpatient clinic of a university hospital between October 2015 and October 2019 were evaluated. 357 of 1403 patients had type 2 DM. 123 patients with complete data and a diagnosis of DM for at least 2 years were included in the study. The exclusion criteria and the number of patients excluded are given in Figure-1.

BMI, body mass index; DM, diabetes mellitus.

Ethical standards

The research protocol was approved by the local ethics committee (Approval Date and Number: 11/12/2019; 19-12T/48). Each participant was informed about the study and signed a consent form.
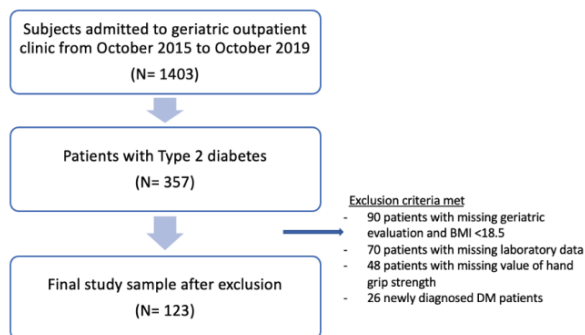
Figure-1. Flow chart of patients enrolled in the study.

Assessment of muscle strength and muscle mass

Muscle strength was assessed by hand grip strength. The patients were asked to squeeze the Takei digital hand dynamometer with their best performance while standing with arm by their side with full elbow extension. This process was repeated three times with one minute intervals, and the average of three measurements was recorded. There are several different cut-off points to determine low muscle strength. The recommended cut-off thresholds for hand grip strength are 32 / 22 kg (male / female) in the Turkish population (12). Recently, these cut-off points were determined as 27 / 16 kg (male / female) by The European Working Group on Sarcopenia in Older People-2 (EWGSOP) (13). We used the Turkish population specific cut-off points for hand grip strength in this study. Patients who had hand grip strength below those cut-off points have been defined as 'possible sarcopenia'.

Bioelectrical impedance analysis was used for the measurement of muscle mass (Tanita Mc 780 ST). The fat free mass (FFM) values of the patients were determined with the bioelectrical impedance analysis with an empty stomach and bladder. Skeletal muscle mass (SMM) measurement was calculated using the following formula validated from FFM: [SMM (kg) = 0,566 × FFM] (14). Skeletal muscle mass index (SMMI) was calculated as skeletal muscle mass (SMM) (kg) divided by the square of height in meters (m^2) (15). The cut-off value for SMMI was taken as <9.2 kg / m^2 in men and <7.4 kg / m^2 in women (12). Patients who had both low hand-grip strength and low SMMI was considered to have sarcopenia (13).

Comprehensive geriatric assessment

Comprehensive geriatric assessment provides appropriate and accurate assessment of the older adults with an interdisciplinary approach (16).

Mini Nutritional Assessment

Mini Nutritional Assessment (MNA) is used for screening and diagnosis of malnutrition, and has been shown to be sensitive for malnutrition in older adults. A score of 24 and more identifies patients with a normal nutritional status (17).

Mini Mental State Assessment

Mini Mental State Assessment (MMSA) is one of the rapid cognitive screening tests that is frequently preferred in older adults. The individual's orientation, memory, attention and language ability are evaluated out of 30 points (18).

Geriatric Depression Scale-15 Short Form

Geriatric depression scale-short form (GDS-SF) is a 15-question test applied easily and quickly, and it evaluates depressive symptomatology of the individual. Depression should be suspected of 5 points or more according to 'yes' and 'no' answers (19).

Katz Activities of Daily Living scale

Katz Activities of Daily Living scale is an instrument that is evaluated over 6 points by asking questions about bathing, dressing, going to the toilet, transferring, continence, and feeding (20).

Lawton Brody Instrumental Activities of Daily Living scale

Lawton Brody Instrumental Activities of Daily Living scale (Lawton Brody IADL scale) is a valuable instrument that assess necessary life skills for independent living such as personal hygiene, dressing and clothing care, health care, cooking, eating, nutrition, financial management (21). In Lawton Brody IADL scale, a point between 0 and 13 means dependency, between 14 and 22 means semi-dependency, and 22 and over means independency (22).

Anthropometric measurements

The BMIs of the patients were calculated as their weight (in kilograms) divided by the square of their height (in meters) (kg / m^2). BMI was classified as; 18.5 to 24.99 means normal weight, 25 to 29.99 means overweight, 30 or over means obese. Patients with BMI of less than 18.5 kg/m^2 were excluded from the study.

Statistical analysis

Statistical analyses were performed using SPSS v.25. Descriptive statistics were given as mean ± standard deviation, median (minimum – maximum), frequency, ratio, where appropriate. Student's t test was used to compare two groups of variables with normal distribution, and Mann Whitney U test was used to compare two groups of variables without normal distribution. Chi-square and Kruskal-Wallis tests were used for comparisons of three or more groups. The Mann–Whitney U-test was used when the aim was to show a difference (found with the Kruskal-Wallis test) between two groups. Spearman correlation analysis was used to evaluate the relationships between variables.

RESULTS

Characteristics of the study population

The mean age of 123 patients was 73.6 ± 6.6 (65-92) years. 46 patients (37.4%) were male. 31 (25%) of the patients were living alone. 34 patients were treated with insulin and 60 patients (48.8%) were taking only metformin. The second most prevalent drug in DM treatment was dipeptidyl peptidase-4 inhibitor (DPP-4). Mean Katz Activities of Daily Living score was 5.2 ± 0.8, mean Lawton Brody IADL score was 18.6 ± 0.03, MNA score was 24.2 ± 4.2 and 65% of patients had normal nutritional status. Mean GDS score was 2.8 ± 3.1, and mean MMSA score was 25.7 ± 5.2. We found urinary incontinence in 59 patients, polypharmacy in 43 patients, the risk or presence of malnutrition in 43 patients, in terms of geriatric syndromes. The demographic characteristics of the patients are presented in Table-1.

Table-1. The demographic characteristics of the patients.

	All (n=123)	Insulin (+) (n=34)	Insulin (-) (n=89)	P value
Age (years)	73 (65-92)	72 (65–88)	73 (65-92)	0.775
Female sex (%)	62.6	61.8	62.9	0.906
Living alone (%)	25.2	5.7	19.5	0.466
Hypertension (%)	74	67.6	76.4	0.322
Hyperlipidemia (%)	17.1	17.6	16.9	0.917
CAD (%)	35	52.9	28.1	0.01
Dementia (%)	8.9	8.8	9	0.642*
Medication (n)	6 (1-16)	8 (2-15)	5 (1-16)	0.001
Polypharmacy (%)	63.4	88.2	53.9	0.000
Urinary incontinence (%)	48	47.1	48.3	0.901
Katz score	5 (2-6)	5 (2-6)	5 (2-6)	0.413
LBIADL	22 (0-23)	18 (4-23)	22 (0-23)	0.006
MNA**	25.5 (7.5-29.5)	24 (11-29)	26 (7.5-29.5)	0.024
BMI (kg/m^2)	28.8 (19-56.2)	29.4 (19-47.3)	28.8 (19.1-56.2)	0.581
Obese (%)	43.9	47.1	42.7	
Overweight (%)	37.4	29.4	40.4	
Normal weight (%)	18.7	23.5	16.9	
Hand grip strength (kg)**	22 (6-45)	21 (6-34.3)	23 (8-45)	0.291
Probable sarcopenia (%)	69.1	76.5	66.3	0.275
FFM (kg)	47.5 (33.1-80.7)	51.1 (33.1-80.7)	46.3 (34.4-70.7)	0.536
SMMI (kg/m^2)	10.9 (7-15.8)	11.2 (7-15.4)	10.8 (7.4-15.8)	0.549
Sarcopenia (%)	1.6	2.9	1.1	0.478*
MMSA	27 (8-30)	27 (15-30)	27 (8-30)	0.302
GDS	2 (0-15)	2 (0-14)	2 (0-15)	0.814
FBG (mg/dl)**	124 (76- 409)	156 (76-409)	114.5 (78-206)	0.000
Cr**	0.89 (0.5 – 4.6)	0.98 (0.56-4.6)	0.88 (0.5-1.191)	0.518
HbA1c**	6.7 (5.2 – 16.2)	7.5 (5.5-16.2)	6.5 (5.2-12.3)	0.000

*Fisher's exact test; ** Missing data

CAD, Coronary artery disease; CVA, Cerebrovascular accident; LBIADL, The Lawton Instrumental Activities of Daily Living Scale; MNA, Mini Nutritional Assessment; BMI, body mass index; FFM, free fat mass; SSMI, Skeletal muscle mass index; MMSA, mini mental state assessment; GDS, geriatric depression score; FBG, fasting blood glucose; Cr, creatinine; HBA1c, glycolyzed hemoglobin

Table-2. The distribution of BMI and insulin therapy in patients with DM

		BMI classification			
		Normal weight 18.5-24.9	Overweight 25-29.9	Obese 30 and over	Total
Insulin therapy	No	15	36	38	89
	Yes	8	10	16	34
Total		23	46	54	123

BMI, body mass index; DM, diabetes mellitus.

Associations of hand-grip strength, muscle mass and possible sarcopenia with BMI

It was observed that there was significant association between the hand grip strength and BMI groups (Chi-Square = 8.023, df = 2; p = 0.018). No significant difference was observed neither between overweight and normal weight patients nor between overweight and obese patients (p = 0.85, p = 0.214, respectively). A significant difference was found in the hand grip strength between normal weight patients and obese patients (p = 0,04). Negative correlation was observed between BMI and hand-grip strength of the patients (r = -0,278, p = 0,002). Hand-grip strength was lower in patients with high BMI. Significant and positive correlation was observed between BMI and SMMI (kg / m^2), and SMMI (kg / m^2) increased as BMI increased (r = 0,516, p=0,001). There was no significant difference between BMI groups in terms of possible sarcopenia (p = 0.735).

Associations of hand-grip strength, muscle mass and possible sarcopenia with using insulin therapy

The incidence of cardiovascular disease and the presence of polypharmacy were higher in patients with insulin therapy than in patients without insulin therapy. There was no difference between the groups in terms of use of statin and angiotensin converting enzyme inhibitors which may affect muscle strength and mass (p = 0.467 and p = 0.814, respectively). In addition, IADL scores were lower in patients with insulin therapy than in patients without insulin therapy.

The mean value of BMI was 31.1$\pm$ 7.5 kg / m^2 in patients with insulin therapy, and there was no significant difference between the two groups. The mean value of the muscle strength in patients with insulin therapy was 21.2 $\pm$ 6.9 kg. There was no significant difference in the values of handgrip strength and SMMI between two groups. There was also no significant difference between these groups in terms of the presence of possible sarcopenia and sarcopenia (p = 0.275).

The effect of insulin therapy on handgrip strength and muscle mass within BMI groups

Handgrip strength and SMMI were compared within the BMI groups according to use of insulin therapy. No significant difference was found in the handgrip strength and SMMI in the ideal weight, overweight and obese groups compared to use of insulin therapy or not (handgrip strength p = 0.456, 0.431, 0.595 and SMMI p = 0.651, 0.299, 0.747, respectively). Both individuals with sarcopenia were in the normal weight group, and there was no significant difference in possible sarcopenia and sarcopenia within BIA groups in terms of using insulin therapy (probable sarcopenia p = 0.666, 0.064, 0.555 and sarcopenia p = 0.585, none, none, respectively). Table-2 shows the distribution of BMI and insulin therapy in patients with DM.

DISCUSSION

In this study, the relationships between hand grip strength, muscle mass and BMI, and insulin therapy were investigated in older patients with type 2 DM. Since patients with a BMI under 18.5 were not included in the study, the effect of being underweight was excluded. This study found that there was a negative correlation between BMI and hand grip strength, and a positive correlation between BMI and SMMI. No significant relationship was found between insulin therapy and hand grip strength or muscle mass.

Results of a study conducted in older Asian patients with DM were similar to our study; there was a positive correlation between BMI and SMMI (23). However, since sarcopenia was defined according to The Asian Working Group for Sarcopenia (AWGS) in this study, relationship between BMI and hand grip strength was not investigated, and the number of patients with only low hand grip strength was not determined. In a study conducted with type 2 DM patients in the outpatient setting, BMI with a cut-off point of 24.4 kg / m^2 predicted sarcopenia as much as walking speed (24).

In another study, type 2 DM Japan patients aged 20 years and older were followed at least 9 months, similarly they found that insulin therapy did not affect hand grip strength. However, unlike our study, this study showed that insulin therapy was found to be protective against SMMI decline. In the same study, change in SMMI in a year was correlated with BMI (25). Similarly, Ferrari et al. followed up type 2 diabetic patients for 3 years, and they showed no effect of insulin therapy on the hand grip strength (9).

In our study, it was found that insulin therapy had no effect on muscle strength and muscle mass within BMI groups. Although studies on the general population have found a relationship

between BMI and the presence of sarcopenia (10, 11), there has been no research on older patients with DM.

Prevalence of probable sarcopenia was estimated by only handgrip strength as recommended by EWGSOP2. Probable sarcopenia was found in 69.1% of patients with DM, while sarcopenia was found in only 1.6% of patients with DM. In the literature, the prevalence of sarcopenia varies between 12% and 18% in older patients with type 2 DM according to the AWGS and increases to 40% in DM patients aged older than 80 years (23, 24, 26). The prevalence of sarcopenia varies between 2% and 4% according to EWGSOP2. It is lower than prevalence of sarcopenia by AWGS algorithm, and it is similar to our study (27, 28).

Our study has some limitations. One of limitations is the small sample size (n = 123) since this study was conducted in a single center. Another limitation is the lack of data evaluating muscle function such as gait speed. Information such as vitamin D level, smoking history, exercise or presence of diabetic neuropathy, which may affect muscle function, are also missing.

CONCLUSION

Diabetes mellitus is one of the crucial chronic diseases that is common in advanced age, and affects the quality of life and functional status. This study was conducted on patients without low BMI values, and this feature of the study may have led to high muscle mass values to be measured. In order to identify true sarcopenic patients in older patients with normal weight and obese DM, anthropometric differences should be considered. Evaluation of muscle quality might be more useful in overweight and obese patients, and the association of BMI and muscle strength needs further investigation. In our study, the effect of insulin therapy on muscle mass and muscle strength was not shown in older diabetic patients. Prospective longitudinal studies are needed in this topic.

Conflict of interest

The authors declare that they have no conflict of interest.

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The concurrent use of hyponatremia-inducing drugs in older patients, a case report

Hiponatremiye neden olan ilaçların yaşlı hastalarda eşzamanlı kullanımı: Bir vaka sunumu

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ABSTRACT

While the value of preventive healthcare services comes up repeatedly, the healthcare professionals are now trying to find solutions for the expanding geriatric population's problems before they occur. The risk of drug-drug interactions may get preventively reduced in older patients with the selection of co-medications that are less likely to interact. The choice of drugs for older patients is crucial when commencing with potential incriminated agents together, such as, serotonin and norepinephrine reuptake inhibitors, selective serotonin reuptake inhibitors, diuretics, proton pump inhibitors, nonsteroidal anti-inflammatory drugs, etc., which could interact with each other and cause hyponatremia in a short period of time. In this paper, a rare case of an older patient with venlafaxine-induced hyponatremia has been presented.

Keywords: Aged, venlafaxine hydrochloride, hyponatremia, diuretics.

ÖZ

Koruyucu sağlık hizmetlerinin önemi tekrar tekrar gündeme gelirken, sağlık profesyonelleri artık, artan geriatrik nüfusun sorunlarını, henüz ortaya çıkmadan, irdeleyerek çözümler aramaktadır. Geriatrik hastalarda ilaç-ilaç etkileşimi riski, etkileşme olasılığı daha düşük olan ilaç grupları seçilerek kısmen de olsa önlenebilmektedir. Geriatrik hastalarda ilaç seçimi, kısa sürede hiponatremiye neden olabilecek serotonin-norepinefrin geri alım inhibitörleri, seçici serotonin geri alım inhibitörleri, diüretikler, proton pompa inhibitörleri ve non-steroidal anti-inflamatuvar ilaçlar gibi potansiyel medikasyonların kullanımında önemli olabilmektedir. Bu olgu sunumunda venlafaksin kullanımı sonrası hiponatremi gelişen bir geriatrik hasta sunulmuştur.

Anahtar Sözcükler: Yaşlı, venlafaksin hidroklorür, hiponatremi, diüretikler.

INTRODUCTION

Nowadays, venlafaxine is a serotonergic and noradrenergic antidepressant widely used as an alternative to selective serotonin reuptake inhibitors (SSRIs). Since we know that venlafaxine and SSRI antidepressants' efficacy are similar and limited especially in older adults with chronic diseases, the physicians have to evaluate the patients in detail before commencing them (1). Not only co-medication and polytherapy, but also other factors such as poor physiological conditions in older people, genetic background (metabolizers) and chronic diseases, can play a role in the drug-drug interaction (1).

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Chronically low serum sodium (Na) concentrations tend to be the least symptomatic. Older people are also at the highest risk of severe side effects such as central pontine myelinolysis if the Na concentration is corrected too rapidly. Still, hyponatremia tends to be asymptomatic in the setting of chronically low serum Na concentrations. As we know, the most common causes of hyponatremia are as follows: The syndrome of inappropriate antidiuresis, drugs, polydipsia, adrenal insufficiency, hypervolemia, and other diseases (e.g., heart failure, liver cirrhosis). The most important drugs associated with asymptomatic or symptomatic hyponatremia are diuretics, antidepressants, and antiepileptics (2). Antidepressant-induced hyponatremia, which is mostly related to the use of psychotropic agents, including serotonin and norepinephrine reuptake inhibitors (SNRIs) and SSRIs, can cause significant morbidity and mortality in older patients. The "tea and toast" phenomenon is also known as another factor that could be a potential contributor to hyponatremia in older patients with a diet deficient in protein and Na. The risk of drug-drug interactions could be preventively reduced in older patients with the selection of co-medications that are less likely to interact with each other. In this case, we report a rare cause of hyponatremia in an older patient and criticize whether hyponatremia's main reason could be venlafaxine or the combined effect of venlafaxine and hydrochlorothiazide. The authors certify that they have obtained all appropriate patient consent forms.

CASE PRESENTATION

A female patient aged 88 years was admitted to our hospital's physical therapy service due to her gonarthrosis. We learned that the patient had taken valsartan and hydrochlorothiazide as anti-hypertensive drugs for about ten years, and also the patient had been on a low-sodium diet for high blood pressure. Her medical history did not reveal any other specific feature. On physical examination, the heart was in sinus rhythm, and there was no pretibial edema. Her respiratory system examination was normal. She was not dyspneic and tachycardic. The patient had no other complaints including fever, dysuria, vomiting, thirst or diarrhea, etc. No pathologies, such as kidney failure, heart failure, head injury history, or malabsorption were previously known and no disruptive fluid and electrolyte balance were encountered.

The patient was given on acetaminophen 500 mg tablet once a day and ketoprofen gel twice a day until she was discharged after ten days of hospitalization. The patient was consulted with psychiatry on the second day of her hospitalization for unhappiness and sudden uncontrollable crying complaints lasting for a few months. After had been diagnosed with moderate depression disorder, a venlafaxine tablet was started for her treatment. The Na level was 137 mg/dl on the first day of admission. On the second day of the venlafaxine treatment, the patient was consulted to us for hyponatremia since the patient's Na value was reduced to 124 mg/dl and the serum osmolarity was 288 mOsm/L. After detailed medical history taking, the patient's treatment was rearranged, considering the fact that hyponatremia developed primarily due to drug interaction or initiation of venlafaxine alone. Lercadipin tablet was started once daily instead of valsartan and hydrochlorothiazide for hypertension, but the psychiatrist advised not to start any other antidepressant for a while instead of venlafaxine. Since the patient had symptoms such as headache and weakness, hypertonic fluid was started for hyponatremia, and Na value reached 135 mg/dl at the end of the third day. The patient was discharged after being informed that she needs to come to the outpatient clinic for Na control.

DISCUSSION

Hyponatremia is common in older adults with the incidence varying between 11% and 18%, and its underlying reason can be a psychoactive drug. So after starting such therapies in older patients, electrolytes should be measured within 2-5 days. We have just found a few studies and a handful of case reports presenting data on hyponatremia with venlafaxine in the medical bibliography. Most of them are limited to older patients. In a cohort study, 89.0% of 54.038 participants aged 65 and over received at least one antidepressant (54.7% SSRIs, 31.6% tricyclic antidepressants, 0.2% monoamine oxidase inhibitors, 13.5% other antidepressants). During follow up between 1996 and 2007, venlafaxine was found to be associated with higher adjusted hazard ratios for stroke / transient ischemic attack, fracture, and epilepsy / seizures than the other drugs (3). In a review, both SSRIs and venlafaxine, especially when added on the patient's risk factors such as

older age (OR = 6.3) and concomitant use of diuretics (thiazide) (OR = 11.2 - 13.5), was found to have a potentially dangerous side effect such as hyponatremia (4). Because the serum osmolarity was in the normal range and there was no history of head trauma, thyroid diseases, cancer, etc., and any other causes of dilutional hyponatremia such as heart failure, kidney failure, or liver cirrhosis, we treated our case as hyponatremia due to usage of potentially inappropriate medication that could cause electrolyte disturbance in an older patient.

Furthermore, the cause of hyponatremia might be a result of the synergistic effect potentiated by venlafaxine and hydrochlorothiazide combined together. The gradually lowering of Na and fast recovery from hyponatremia after the withdrawal of drugs made us focus on the interaction between concurrent use of hyponatremic drugs. The low Na concentrations of most patients who are on the medication of SNRIs / SSRIs, return to normal range within days or weeks after withdrawal. We had the same results in our case. If hyponatremia worsens the problem can be managed with modest fluid restriction, subjecting the patient to close continued clinical observation and biochemical monitoring instead of discontinuing drug treatment. As the population age, the importance of choosing appropriate drugs for older patients has emerged. For example, whether some of the drugs such as SNRIs, SSRIs, diuretics, proton pump inhibitors and nonsteroidal anti-inflammatory drugs have a potential risk or not for hyponatremia, should be taken into consideration by a physician when prescribing them for older patients (5). Moreover, the Dutch Pharmacogenetics Working Group of the Royal Dutch Association for the Advancement of Pharmacy recommends venlafaxine dosing based on CYP2D6 genotype, which is not possible for many countries routinely at the moment.

CONCLUSION

All in all, most older adults with chronic diseases are susceptible to electrolyte abnormalities, including hyponatremia. The combined use of medications potentially causing hyponatremia such as diuretics and some psychoactive drugs could be proactively avoided by physicians, especially for those patients that are at risk. Physicians should bear in mind that older patients have a higher propensity to develop hyponatremia after starting venlafaxine therapy, especially with those on diuretics.

Conflicts of interest: There are no conflicts of interest.

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Splenic infarction as a rare cause of abdominal pain in older adults: A case report

Yaşlılarda nadir bir karın ağrısı nedeni splenik infarkt: Olgu sunumu

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ABSTRACT

Spontaneous splenic infarction has been rarely reported within aged population. The diagnosis of the condition is based on clinical findings and splenic imaging. In recent years, ultrasonography and computed tomographic scan have gained in popularity for the diagnosis of splenic infarction. Most reported cases are focal infarctions, and treatment is mostly conservative. We described the case of a 82-year-old female with cured breast cancer, paroxysmal atrial fibrillation, hypertension who had left upper quadrant pain within 15 days. Physical examination on admission revealed a palpable splenomegaly. Abdominal computed tomography scan showed many subcapsular infarct zones of the spleen measuring 16 cm in length and 4.5 cm conglomerate lymphadenopathies within periportal region. Doppler ultrasound revealed wedge-shaped heterogeneous hypoechoic avascular areas and lymphadenopathies. After laboratory tests, the underlying cause was found as marginal zone lymphoma. The patient was treated with conservative management and chemotherapy was planned for specific cause. Splenic infarction must be kept in mind for older patients with underlying comorbidities presenting with acute left upper quadrant pain.

Keywords: Older adult, splenic infarction, abdominal pain.

ÖZ

Spontan dalak infarktı, yaşlı yetişkinlerde nadir görülen karın ağrısı nedenlerinden biridir. Tanı; klinik bulgular ve görüntüleme yöntemleri ile konur. Geçmiş yıllarda ultrasonografi ve bilgisayarlı tomografinin splenik infarkt tanısındaki yeri önem kazanmıştır. Raporlanmış çoğu dalak infarktı fokaldir ve konservatif tedavi edilmektedir. 82 yaşında kadın hasta, 15 gün önce başlayan karın ağrısı nedeni ile başvurdu ve özgeçmişinde meme kanseri, paroksismal atriyal fibrilasyon ve hipertansiyon olduğu öğrenildi. Fizik muayenede; dalak kot altında palpe edilmekteydi. Bilgisayarlı tomografide; 16 cm uzunlukta ölçülen dalağın içinde subkapsüler infarkt alanları ve periportal alanda 4,5 cm çaplı konglomere lenfadenopati saptandı. Doppler ultrasonografide kama şeklinde infarkt alanları ve heterojen hipoekoik avasküler alanlar olduğu görüldü. Laboratuvar tetkikleri sonrasında altta yatan nedenin marjinal zon lenfoma olduğu saptandı. Hastaya konservatif tedavi verildi ve hematolojik maligniteye yönelik kemoterapi planı yapıldı. Komorbiditeleri olan yaşlı yetişkinlerde, akut başlangıçlı sol üst kadran ağrısıyla karşılaşıldığında dalak infarktı akılda tutulması gereken bir durumdur.

Anahtar Sözcükler: Yaşlı, splenik infarkt, karın ağrısı.

INTRODUCTION

Abdominal pain is a common complaint among older adults. The differential diagnosis of acute abdominal pain includes many medical conditions such as acute cholecystitis, acute pancreatitis, peptic ulcer perforation, mesenteric ischemia, intestinal obstruction and aortic aneurysm. Misdiagnosis of acute abdominal pain is more common within aged population, and results with higher mortality (1).

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Splenic infarction is a rare medical condition of older patients which cause acute abdominal pain. The most common causes of splenic infarction are hematologic diseases, bacterial endocarditis, cardioembolic events, sickle cell anemia and procoagulant conditions. Atypical presentation is not rare, but majority of the patients have fever, nausea, vomiting and left upper quadrant pain radiating to back and left shoulder. As in many other diseases peritoneal inflammation signs and fever are usually absent in older adults (2).

CASE PRESENTATION

An 82-year-old female patient admitted to the hospital with left upper quadrant abdominal pain radiating to shoulder for the last 15 days. Comorbidities of the patient were breast cancer and paroxysmal atrial fibrillation. She was considered cured after mastectomy and chemotherapy. Additionally, she was using irregular warfarin for paroxysmal atrial fibrillation. She was examined in another hospital for abdominal pain and computerized tomography (CT) was performed. CT revealed splenomegaly of 16 cm in length and heterogeneity of spleen. She was diagnosed as spleen infarction and hospitalized, and treatment for cardioembolic spleen infarction was started. Additionally, ceftriaxone was given for a possibility of infective endocarditis because of her fever. However transthoracic echocardiogram showed no vegetation, and the pain could not be controlled during follow-up, and fever was never documented again. With these atypical findings, diagnosis of cardioembolic spleen infarction and infective endocarditis were reconsidered and the patient was transferred to tertiary hospital for further investigation and management.

The physical examination revealed body temperature of 36˚C. Blood pressure was 130 / 60 mmHg, heart rate was 103 /min and rhythmic. There was no extra murmur. Crepitation was heard on left lower lob of lung area. The abdomen was tender, left upper quadrant of abdomen was defensive with no rebound. Dull tone was heard in Traube region and spleen was palpable. Left costovertebral angle was tender. No peripheral lymph nodes were palpated, and other examination findings were normal.

Laboratory tests performed resulted as, leukocytes: 8080 10^3 / μL, neutrophil: 5760 10^3 / μL, hemoglobin: 11,2 g / dL, platelet: 172000 10^3 / μL, sodium: 139 mEq / L,

potassium: 4 mEq / L, clor: 101 mEq / L, urea: 26 mg / dL, creatinine: 0,73 mg / dL, AST: 52 U / L, ALT: 15 U / L, GGT: 211 U / L, ALP: 117 U / L, CRP: 153 mg / L, LDH: 1045 U / L and erythrocyte sedimentation rate: 30 mm / h. Peripheric blood cultures were negative.

We discontinued antibiotic treatment because there was no evidence of infective endocarditis. The patient had no fever for over 10 days, no murmur was heard in cardiac auscultation regions. And blood cultures were negative. As the patient had paroxysmal atrial fibrillation, enoxaparin sodium of 6000 IU per day was ordered for routine use. Abdominal pain did not resolve with 1 gr of intravenous paracetamol four times a day so we started intravenous tramadol of 50 mg twice a day which was prominently enough for pain palliation. No oxygen therapy was needed. During follow-up she had acute severe abdominal pain despite use of tramadol. Another CT was performed for differential diagnosis of a possible splenic rupture. CT was reported as splenomegaly with subcapsular wedge shaped infarct zones and patent splenic artery and left sided peritoneal thickening. There were no signs of splenic rupture. The pain dissolved with intravenous tramadol of 100 mg use for 3 days and peroral form was prescribed to use when necessary.

Infectious diseases tests for Epstein-Barr virus, cytomegalovirus, salmonella, brucella, leishmania, Echinococcus granulosis and hepatitis viruses were performed, and resulted negative. No Plasmodium was detected in thick blood smear. Cirrhosis and heart failure were excluded with the help of clinical findings. Portal system doppler ultrasonography (USG) was performed for portal blood flow investigation and documented hypoechoic conglomerated lymph nodes of 4.5 cm in diameter in periportal region, heterogeneity of spleen with hypoechoic regions and a possible focal infarct zone or decreased perfusion area of 4x4 cm.

Peripheral blood smear test was performed to find the etiology of splenomegaly. Dysplastic neutrophils hypo segmentation, toxic granulation, ring nucleus, Pelger-Huet anomaly and hairy cell projections of lymphocytes were detected. With the help of documented splenomegaly and lymphadenopathies in imaging methods and peripheral blood smear findings the diagnosis changed to splenic infarction caused by a hematologic malignity.

Figure-1. Splenic infarction on axial section of contrast enhanced computed tomography of abdomen.

The patient was consulted to general surgery department for splenectomy or excisional lymph node biopsy for definite diagnosis, however operation was found highly risky for the patient with joint decision. Instead of splenectomy bone, marrow biopsy was preferred because it was less invasive and safer for the patient. The definitive diagnosis has been pathologically documented by bone marrow biopsy as marginal zone lymphoma.

DISCUSSION

Acute abdominal pain is a common cause of hospital admissions among older adults. Unlike young adults it is difficult to diagnose correctly in advanced aged population. Difficulties for taking reliable medical history, atypical disease presentations, delayed symptoms, late admission to hospital and less evident clinical findings may lead to misdiagnosis more often (3).

Spleen infarction is a rare condition in older adults which presents with acute abdominal pain, fever, nausea, vomiting, leukocytosis and splenomegaly (2). In older patients, symptoms may be less evident, and fever and peritoneal irritation signs may be dimmer.

The causes of splenic infarction may include splenomegaly of hematologic diseases, septic emboli, cardioembolic events, sickle cell anemia, prothrombotic conditions such as Antiphospholipid syndrome.

In a retrospective study, the most common causes of splenic infarctions were found to be hematologic and prothrombotic events (4). Another study of Antopolsky et al revealed that 71% of patients with spleen infarction were found

to have another underlying disease. In the same study, the most common cause for known thrombosis risk factor was found as atrial fibrillation in 21% of patients. Essential hypertension and diabetes mellitus were present in 31% and 23% of the patients, respectively (5). Our patient had a combination of hematological infiltrative malignancy and cardioembolic risk factors.

Splenic infarction must be kept in mind for patients with acute abdominal pain who have splenomegaly and procoagulant conditions and cardioembolic risk factors. However, not all patients present with abdominal pain. A study showed only half of the patients had pain in the upper left quadrant, and 36 % of all had tenderness in the left abdomen (2).

Diagnosis of splenic infarction is easily made with Doppler USG and CT imaging along with clinical findings (6). In the case we presented, the diagnosis was finalized with the presence of wedge shaped areas that were lack of blood flow.

Treatment is usually conservative and aimed at pain palliation. In the presence of fever, splenic abscess must be kept in mind, and antibiotic therapy should be planned at the point where infectious causes are considered (7). It is important to determine the underlying cause of splenic infarction and to treat the main cause so that this condition does not recur. In our case, enoxaparin and treatment with analgesics was continued due to the fact that there was also a history of atrial fibrillation. Cardioembolic causes were considered first, but further examinations were carried out due to incompatibility in clinical and laboratory findings and a preliminary diagnosis of spleen infarction due to hematological malignancy was approached.

Splenectomy is not required in every splenic infarction. Indications for splenectomy include subcapsular hematoma, splenic pseudocyst, abscess and splenic rupture (8). In our patient, the possibility of splenic rupture was also considered because of the development of severe pain with sudden onset but was not detected in imaging methods. Splenectomy may be necessary for a definitive diagnosis when there is a preliminary diagnosis of a malignant disease. In our case, a bone marrow biopsy was preferred because it was more comfortable for the patient, and had low morbidity. Therefore, we did not need splenectomy for further

investigation. As a result, the patient was diagnosed with marginal zone lymphoma, and the actual treatment plan was revised.

Marginal zone lymphoma is a hematological malignancy that can often cause splenomegaly, and about half of patients are of advanced age (9). Splenic infarction of marginal zone lymphoma is not often, but a case was reported with recurrent infarctions (10). Our case is interesting because it is a marginal zone lymphoma case that presents with acute abdominal pain and is diagnosed with splenic infarction.

CONCLUSION

Although there are many conditions that can cause abdominal pain in the elderly, splenic infarction is a condition that should be kept in mind, especially in the upper left quadrant and acute abdominal pain. Determining the etiology of splenic infarction is the main predictor of prognosis.

The case report was prepared with patients informed consent.

Conflict of interest

There is no conflict of interest between the authors.

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The coexistence of hemophagocytic syndrome and DRESS syndrome that develops in the course of sepsis in an elderly patient in intensive care unit

Yoğun bakımda yatan yaşlı hastada sepsis seyrinde gelişen hemofagositik sendrom ve DRESS sendromu birlikteliği

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ABSTRACT

Sepsis is one of the leading causes of mortality in intensive care units. Its mortality increases, especially with the high number of comorbidities and immunosuppression. Hemophagocytic syndrome is an uncontrolled cytokine storm that develops in the course of increased inflammatory conditions such as sepsis. The clinical picture is very wide; because of nonspecific symptoms. For this reason; to diagnose hemophagocytic syndrome, it must be kept in mind. Mortality in hemophagocytic syndrome is especially high in intensive care patients. Drug reaction with eosinophilia and systemic symptoms syndrome is a rare, infrequent drug reaction. The clinical picture is heterogeneous and symptoms may be prolonged despite discontinuation of the drug. Overlap of different diagnoses in elderly patients; In the presence of multiple drug use and chronic diseases, clinical management is difficult and early initiation of effective treatment can be delayed. In this case report; a 66-year-old male patient who underwent nephrostomy due to bilateral hydronephrosis and who developed sepsis and HPS in the follow-up after hospitalization with high fever and complicated with drug reaction with eosinophilia and systemic symptoms syndrome during treatment is presented.

Keywords: Sepsis, critical care, eosinophilia.

ÖZ

Sepsis, yoğun bakımda mortalitenin önde gelen sebeplerinden birisidir. Sepsis, komorbiditeler ile immünsupresyon varlığında mortaliteyi geriatrik hastalarda daha da artırmaktadır. Hemofagositik sendrom, sepsis gibi artmış inflamatuvar durumların seyrinde gelişen kontrolsüz sitokin fırtınasıdır. Klinik tablo heterojen olduğu için akla gelmedikçe tanı konulması zordur. Bu sendromun mortalitesinin özellikle yoğun bakım hastasında yüksek olduğu bilinmektedir. DRESS; çok nadir görülen fakat ağır seyredebilen ilaç reaksiyonudur. Klinik tablo heterojendir ve ilacın kesilmesine rağmen bulgular uzayabilir. Yaşlı hastalarda farklı tanıların örtüşmesi; çoklu ilaç kullanımı ve kronik hastalıkların da varlığında klinik yönetimi zorlaştırmakta ve etkin tedavinin erken başlanmasını geciktirmektedir. Bu olgu sunumunda; bilateral hidronefroz sebebi ile nefrostomi takılan ve ateş yüksekliği sebebiyle ile servise yatırıldıktan sonra izlemde sepsis, hemofagositik sendrom gelişen ve tedavi sırasında DRESS sendromu ile komplike olan 66 yaşında erkek hasta sunulmuştur.

Anahtar Sözcükler: *Sepsis, yoğun bakım, eozinofili.*

INTRODUCTION

Sepsis is defined in the current literature as a life-threatening condition caused by an irregular host response to infection (1). Sepsis-related mortality reported as 35% in epidemiological studies (2), this rate reaches 60% in patients who develop septic shock. Despite all treatment options, sepsis is one of the leading causes of death in an intensive care patient.

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Hemophagocytic syndrome (HPS), on the other hand, is a rare but high-mortality clinical emergency that develops as a result of excessive activation of the inflammatory process (3).

Drug Reaction with Eosinophilia and Systemic Symptoms (DRESS) syndrome is a very rare serious drug reaction with systemic involvement (4). Geriatric diseases are often atypical and complex, causing some clinical conditions to overlap. This, in turn, causes us to encounter some difficulties in diagnosis and treatment, as in our case. In this case presentation, geriatric patient who was admitted to intensive care with a diagnosis of sepsis, complicated by HPS in follow-up and accompanied by DRESS syndrome, are discussed by literature data.

Case presentation

A 66-year-old male patient was interned for service monitoring due to a urinary tract infection. He had diagnosis of hypertension, diabetes mellitus, chronic kidney failure in his medical history. He had left nephrostomy due to bilateral hydronephrosis and was being treated with antibiotics containing meropenem, ertapenem, tigecycline due to the growth of carbapenem-resistant *Klebsiella Pneumonia*. At the third week of treatment, after a change in conscious, fever, increase in liver function tests and bisitopenia; he was transferred to the Internal Medicine Intensive Care Unit with a preliminary diagnosis of sepsis. Glasgow Coma Scale was nine in admission. Patient's blood pressure was 130 / 70 mmHg, pulse 83 / min, respiratory rate 16 / min, fever 37.9 °C, fingertip saturation 94% in room air. AST 178 U / L, ALT 120 U / L, ALP 176 U / L, GGT 64 U / L, albumin 2.5 mg / dL, urea 132 mg / dL, creatinine 6.1 mg / dL, CRP 41 mg / L, ph 7.29, bicarbonate 13 mmol / L, leukocyte 8750 / µL, hemoglobin 9.6 g / dL, platelets 50.000 / µL, INR 2, fibrinogen 271 mg / dL were in laboratory findings. No biliary tract pathology was detected in magnetic resonance cholangiography (MRCP), which was taken after intrahepatic biliary tract dilatation, 10.5 mm in the proximal section of the ductus choledocus. Bone marrow aspiration and biopsy was performed on the patient after serum triglyceride 188 mg / dl, HDL cholesterol 5 mg / dL, ferritin 1087 µg / L, which was considered with a preliminary diagnosis of HPS associated with sepsis due to deepening in cytopenia, increased consciousness disorder, continued fever and reported as normocellular bone marrow. 400 mg / kg / day; 5 days, intravenous immunoglobulin (IVIG) was added to treatment

with sepsis-related HPS diagnosis in a patient with 5/ 8 criteria from HPS diagnostic criteria. On the fourth day of treatment, his cytopenia improved and bilirubin levels declined. But on the eighth day, widespread maculopapular rashes appeared throughout the body, the number of eosinophils was found to be 1000 / µL on the hemogram, and again increase in the liver function tests and bilirubin progression were observed. 1 mg / kg prednisolone was added to the treatment with the diagnosis of DRESS syndrome. Viral hepatitis markers including hepatitis A, B, C and anti-nuclear antibody (ANA) test were negative. During follow-up, the patient's rash decreased, and there was an improvement in bilirubin and liver function tests. The patient, who was evaluated as end-stage renal failure, was enrolled in a routine hemodialysis program and on the fifteenth day, was transferred to the service.

DISCUSSION

Hemophagocytic syndrome should be the diagnosis that should come to mind in cases when clinical follow-up worsens and / or does not improve despite appropriate parenteral antibiotic use and hemodynamic management in a sepsis patient. (5). In adults, malignancy, infection, autoimmune and autoinflammatory diseases are the leading causes of HPS (3). Hemophagocytic syndrome occurs as a clinical condition in which many organ systems are affected and have nonspecific symptoms and findings such as fever, cytopenia, coagulopathy, hepatosplenomegaly, change of consciousness, seizure and hemodynamic decompensation (3). 2004 diagnostic criteria include fever, cytopenia in at least 2 peripheral blood serial, splenomegaly, hypertriglyceridemia and / or hipofibrinojemia, increased serum ferritin level, low natural killer cell activity, increased serum soluble interleukin-2 (sIL-2R) levels, hemophagocytosis in bone marrow or other tissues. The presence of at least 5 of these criteria is required for diagnosis (6). Our case is a geriatric patient with a high frequency of comorbid disease with nephrostomy and recurrent infections in the urine taken from nephrostomy. During service monitoring, he was consulted with a change of consciousness, fever height, low fibrinogen, and was admitted to the Internal Medicine Intensive Care Unit. Hemophagocytic syndrome was considered in the current clinical picture and was diagnosed with 5 / 8 criteria as a result of laboratory examinations.

Table-1. DRESS Syndrome; RegiSCAR scoring.

	NO	YES	UNKNOWN
Fever (≥38.5 ˚c)	-1	0	-1
Enlarged lymph nodes (≥2, >1 cm)	0	1	0
Atypical lymphocytes	0	1	0
Eosinophils			
700-1499 or 10-19 %		1	
≥1500 or ≥ 20 %		2	
Skin rash	0		0
Extend 50 %	0	1	0
At least 2 of; edema, infiltration, purpura, scaling	-1	1	0
Biopsy suggesting DRESS	-1	0	0
Internal organ involvement			
one		1	
≥ 2		2	
Resolution > 15 days	-1	0	-1
Research done to exclude alternative diagnoses[*]	0	1	0

Final score: <2 =no case, 2-3= possible case, 4-5 =probable case, >5 = definitive case

* 1 point if 3 of the following tests are performed and are negative: HAV, HBV, HCV, mycoplasma, chlamydia, ANA, blood culture.

Current treatment was updated as antibiotic revision and IVIG. Good response to treatment was provided. DRESS syndrome was considered rather than sepsis and HPS progression in the patient, who was not clinically impaired despite the development of skin rash, eosinophilia and increase in liver function tests. The drug that most often causes DRESS syndrome is carbamazepine, and antibiotics are also in etiology (4). RegiSCAR scoring system was used for diagnostic criteria (7) (Table-1) and 1 point with skin rash, 1 point with internal organ involvement, 1 point with eosinophils,1 point with excluding alternative diagnosis were evaluated as a probable case with 4 points. As fist line treatment, steroid 1mg/kg was added, and the patient's clinical and laboratory findings improved.

CONCLUSION

As a result, HPS can often occur with sepsis / sepsis-like clinic or be seen during sepsis. Multiple organ failure and mortality are inevitable if rapid diagnosis and treatment are not started. diagnosis cannot be made unless it comes to mind. Laboratory tests including ferritin, triglycerides, HDL-cholesterol, fibrinogen, and bone marrow aspiration will be guiding with the presence of long-term fever and cytopenia. If DRESS syndrome comes to mind in patients with long-term drug use, both the patient's treatment process will accelerate, and it will be a notification for possible discontinuation of the drug. Geriatric patients, in particular, should be evaluated multidisciplinary both in terms of concomitant comorbidities and overlapping clinical diagnoses due to multiple drug uses.

Conflict of Interest

The authors did not declare a conflict of interest.

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Açık Erişim ve Makale İşleme

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Yazar(lar)dan yazılarının yayımı için herhangi bir ücret talep edilmez.

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Telif Hakkı

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Yazarlık Kriterleri

Makalenin dergi sayfasına yüklenmesi sırasında, tüm yazarların adı, soyadı, ORCID numaraları ve tarih bilgisi ile ıslak imzalarının bulunduğu "Yayın Hakkı Devir Formu" ile yazarlık kriterlerinin

açıklandığı ve yazar katkılarının belirtildiği "Yazar Katkı Formu"nun doldurularak yüklenmesi zorunludur.

Ege Tıp Dergisi, Uluslararası Tıp Dergileri Editörleri Kurulu'nun (*International Committee of Medical Journal Editors*) standartlarını uygulamayı kabul etmiştir. Yazarlar "Biyomedikal Dergilere Gönderilen Makalelerin Uyması Gereken Standartlar: Biyomedikal Yayınların Yazımı ve Baskıya Hazırlanması (*Uniform Requirements for Manuscripts Submitted to Biomedical Journals: Writing and Editing for Biomedical Publication*)'daki yazarlık kriterlerini karşılamalıdır. Bu konudaki bilgiye www.icjme.org adresinden ulaşılabilir.

Etik Sorumluluk

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Araştırma Makalesi, yeni bilgiler içeren ve güncel konularda yapılmış olan orijinal çalışmaları tanımlar. Bu çalışmalar randomize kontrollü, gözlemsel, tanımlayıcı, teşhis veya tedavi doğrulayıcı, klinik, deneysel veya deney hayvanları ile yapılmış olabilirler. Kaynaklar, Öz-Abstract bölümleri ve Tablo/Şekil açıklamaları hariç, ana metin 3000 sözcük sayısını aşmamalıdır.

Olgu Sunumu, okuyucular için önemli olabilecek yeni bir bulgu veya nadir ve ilginç vaka veya durumları, tanı veya tedavi ile ilgili bir yaklaşımı içermelidir. En fazla beş yazar, Kaynaklar listesi hariç, 1000 sözcük ve 10 kaynak ile sınırlıdır. Sadece bir tablo ya da bir şekil ile desteklenebilir.

Klinik Görüntü, eğitsel önemi olduğu düşünülen, orijinal, ilginç ve yüksek kaliteli görüntü içermelidir. En fazla beş yazar, beş kaynak ve bir şekil (fotoğraf, görüntü, çizim, grafik vb.) içerebilir. Kaynaklar listesi hariç 500 kelimeyi geçmemeli, şekil alt yazısı 100 kelimeyi aşmamalıdır.

Teknik Not, eğitim, araştırma, tanı veya tedavi amaçlı gerçekleştirilmiş olan yeni ve orijinal bir uygulamayı, tekniği, alet veya cihazı tarif etmelidir. En fazla beş yazar, beş kaynak ve bir şekil (fotoğraf, görüntü, çizim, grafik vb.) veya tablo içerebilir. Kaynaklar listesi hariç 500 kelimeyi geçmemeli, şekil (varsa) alt yazısı veya tablo (varsa) açıklaması 50 kelimeyi aşmamalıdır.

Editöre Mektup, yayımlanan metinlerle veya mesleki konularla ilgili olarak 500 sözcüğü aşmayan ve beş kaynak ile bir tablo veya şekil içerecek şekilde yazılabilir. Ayrıca daha önce dergide yayınlanmış metinlerle ilişkili mektuplara cevap hakkı verilir.

Davetli Derleme Yazıları, Yayın Kurulunun daveti üzerine, tıpta özellikli konuların kapsamlı değerlendirmelerini içeren, konusunda deneyimli ve yetkin yazarların yazdığı derlemelerdir. Derleme yazıları da derginin değerlendirme sürecinden geçirilir. Kaynaklar, tablo ve şekil alt yazıları hariç 5000 kelimeyi geçmemelidir. En fazla beş yazar ve 80 kaynak ile sınırlıdır. Davetli yazılar dışında derleme yazıları kabul edilmez.

YAZININ HAZIRLANMASI

Ege Tıp Dergisine gönderilen tüm yazılar aşağıdaki kurallara uygun olarak hazırlanmalıdır.

Genel biçim

a- Metin iki satır aralıklı olarak Arial 10 punto ile yazılmalıdır,

b- Sayfa kenar boşlukları 2,5 cm olmalıdır,

c- Sayfalar başlık sayfasından başlamak üzere, sağ üst köşesinden numaralandırılmalı ve satır numaraları eklenmelidir (Microsoft Office Word™ - Düzen - Satır numaraları - Sürekli)

d- Kısaltmalar, metinde ilk olarak açık şekliyle yazılmış olanı takiben, yuvarlak parantez içinde yazılmalı ve tüm metin boyunca kısaltma aynı şekilde kullanılmalıdır. Başlık ve Öz bölümünde kısaltma kullanmaktan kaçınılmalı, metin içinde de gereksiz kısaltma kullanılmamasına özen gösterilmelidir. Cümleler kısaltma ile başlatılmamalıdır.

e- Ana metin içerisinde belirtilen ürün (ilaç, cihaz, donanım veya yazılım vb.), ürünün adını takiben, üretici şirketin adı, şehri ve ülkesi parantez içinde yazılmalıdır. Örnek: Discovery St PET / CT tarayıcı (General Electric, Milwaukee, WI, ABD).

f- Tüm ölçümlerin birimleri metrik sisteme (Uluslararası Birimler Sistemi, SI) göre yazılmalıdır. Örnek: mg/kg, µg/kg, mL/min, µL/h, mmHg, vb. Ölçümler ve istatistiksel veriler, cümle başında olmadıkları sürece rakamla belirtilmelidir.

g- Eğer varsa, uygulanan istatistiksel yöntem, Gereç ve Yöntem bölümünde belirtilmelidir.

h- Herhangi bir birimi ifade etmeyen ve 10'dan küçük sayılar ile cümle başında yer verilen sayılar yazı ile yazılmalıdır. Ondalık sayılar tam sayıdan Türkçe metinlerde virgül ile, İngilizce metinlerde nokta ile ayrılmalıdır.

i- İlgili yazı, yazı türüne göre tarif edilmiş olan bölümler şeklinde hazırlanmış olmalıdır.

Ön Yazı

Editöre hitaben yazının başlığı, yazı türü, ilgili yazının neden Ege Tıp Dergisinde yayımlanması gerektiğini özetleyen kısa bir açıklama ile sorumlu yazar belirtilerek tüm yazarların adı-soyadı, ORCID numarası, kurum ve iletişim bilgileri (telefon, e-posta ve posta adresleri) yazılmalıdır. Yazının daha önce başka bir yerde yayımlanmadığına veya yayımlanmak üzere gönderilmediğine dair yazılı ifade içermelidir. Ege Tıp Dergisi başka bir dilde dahi olsa daha önce yayımlanmış, kabul edilmiş veya değerlendirme aşamasında olan hiçbir yazıyı yayımlamayı kabul etmemektedir. Yazı yazar(lar)ın daha

önce yayımlanmış bir yazısındaki konuların bir kısmını içeriyorsa, bu durumun da ön yazıda belirtilmelidir.

Daha önce bilimsel bir toplantıda sözlü veya poster bildiri şeklinde sunulmuş olan yazılar, sunumun gerçekleştirildiği toplantı ile ilgili bilgiler (tarih, yer, toplantının ismi) olacak şekilde Ön Yazıda belirtilmeli, Öz bölümünün sonuna da not olarak yazılmalıdır.

Ana Metin

Sisteme yüklenen Microsoft Office Word™ formatındaki ana metin dosyasında yazarlara ait isim ve kurum bilgileri yer almamalıdır. Ana metin yazı türüne göre aşağıdaki bölümlerden oluşmalıdır:

- Araştırma Makalesi: Türkçe başlık, Öz ve Anahtar Sözcükler / İngilizce başlık, *Abstract* ve *Keywords* / Giriş / Gereç ve Yöntem / Bulgular / Tartışma / Sonuç / Çıkar Çatışması / Teşekkür (varsa) / Kaynaklar / Tablolar (başlıkları ve açıklamalarıyla beraber) / Şekil Alt Yazıları.

- Olgu Sunumu: Türkçe başlık, Öz ve Anahtar Sözcükler / İngilizce başlık, *Abstract* ve *Keywords* / Giriş / Olgu Sunumu / Tartışma / Sonuç / Çıkar Çatışması / Kaynaklar / Tablo (başlıkları ve açıklamalarıyla beraber) / Şekil Alt Yazısı.

- Klinik Görüntü: Türkçe başlık / İngilizce başlık / Olgu / Çıkar Çatışması / Teşekkür (varsa) / Kaynaklar / Şekil Alt Yazısı.

- Teknik Not: Türkçe başlık / İngilizce başlık / Teknik not / Çıkar Çatışması / Teşekkür (varsa) / Kaynaklar / Tablo (başlıkları ve açıklamalarıyla beraber) (varsa) / Şekil Alt Yazısı (varsa).

Yazının Başlığı

Kısa, kolay anlaşılır ve yazının içeriğini tanımlar özellikte, kısaltma içermeyecek şekilde Türkçe ve İngilizce olarak yazılmalıdır.

Özler

Türkçe (Öz) ve İngilizce (*Abstract*) başlığı altında yazılmalıdır. Araştırma Makalelerinde Amaç, Gereç ve Yöntem, Bulgular ve Sonuç (*Aim, Materials and Methods, Results, Conclusion*) olmak üzere dört bölümden oluşmalı, en fazla 250 sözcük içermelidir. Araştırmanın amacı, yapılan işlemler, gözlemsel ve analitik yöntemler, temel bulgular ve ana sonuçlar belirtilmelidir. Öz metninde kaynak numarası ve mümkün olduğunca kısaltma kullanılmamalıdır. Olgu Sunumlarında bölümlere ayrılmamalı ve 200 sözcüğü aşmamalıdır. Klinik Görüntü, Teknik Not ve Editöre Mektup için öz gerekmemektedir.

Anahtar Sözcükler

Öz (*Abstract)* bölümünün sonunda, Anahtar Sözcükler (*Keywords*) başlığı altında, bilimsel yazının ana başlıklarını yakalayan, *Index Medicus Medical Subject Headings (MeSH)*'e uygun olarak yazılmış en az üç, en fazla beş anahtar sözcük olmalıdır. Türkçe anahtar sözcüklerin, Türkiye Bilim Terimlerinden (*www.bilimterimleri.com*) seçilmesine özen gösterilmelidir.

Metin

Yazı metni, yazının türüne göre yukarıda tanımlanan bölümlerden oluşmalıdır.

Kaynaklar

Ege Tıp Dergisi, ulusal kaynaklardan yararlanmaya özel önem verdiğini belirtir ve yazarların bu konuda duyarlı olmasını bekler.

Kaynaklar metinde, tablo açıklamaları ve şekil alt yazılarında yer aldıkları sırayla, cümle içinde atıfta bulunulan ad ya da cümle bitiminde, noktadan önce yuvarlak parantez "()" içinde, Arabik rakamlarla numaralandırılmalıdır. Birden fazla kaynak numarasının belirtilmesi durumunda rakamlar birbirlerinden virgül ve bir boşluk bırakılarak ayrılmalı ardışık ikiden fazla rakam olması durumunda en küçük ve en büyük rakamlar arasına tire işareti konarak yazılmalıdır. Örnekler: (2, 5, 7); (3-7).

Dergi isimleri, *Index Medicus (PUBMED)*'de kullanıldığı şekilde kısaltılmalıdır. Kısaltılmış yazar ve dergi adlarından sonra nokta olmamalıdır. Yazar sayısı altı veya daha az olan kaynaklarda tüm

yazarların adı yazılmalı, yedi veya daha fazla olan kaynaklarda ise üç yazar adından sonra "*et al."* veya *"ve ark."* yazılmalıdır. Kaynak gösterilen derginin sayı ve cilt numarası mutlaka yazılmalıdır. Sayfa numaraları yazılırken başlangıç ve bitiş sayfa sayılarının sadece değişen basamakları yazılmalıdır. Örnekler: 45-48 yerine 45-8, 219-222 yerine 219-22.

Kaynaklar, yazının alındığı dilde ve aşağıdaki örneklerde görüldüğü şekilde düzenlenmelidir:

Dergilerdeki yazılar

Tkacova R, Toth S, Sin DD. Inhaled corticosteroids and survival in COPD patients receiving long-term home oxygen therapy. Respir Med 2006;100(3):385-92.

Ek sayı (Supplement)

Solca M. Acute pain management: Unmet needs and new advances in pain management. Eur J Anaesthesiol 2002;19(Suppl 25):3-10.

Erken görünümde (E-pub) makale

Butterly SJ, Pillans P, Horn B, Miles R, Sturtevant J. Off-label use of rituximab in a tertiary Queensland hospital. Intern Med J doi: 10.1111/j.1445-5994.2009.01988.x

Kitap

Bilgehan H. Klinik Mikrobiyoloji. 2. Baskı. İzmir: Bilgehan Basımevi; 1986:137-40.

Kitap bölümü

McEwen WK, Goodner IK. Secretion of tears and blinking. In: Davson H (ed). The Eye. Vol. 3, 2nd ed. New York: Academic Press; 1969:34-78.

İnternet makalesi

Abood S. Quality improvement initiative in nursing homes: The ANA acts in an advisory role. Am J Nurs [serial on the Internet] 2002 [cited 12 Aug 2002]. Available from: *www.nursingworld.org/AJN/2002/june/wawatch.htm*

Web sitesi

Cancer-pain.org [homepage on the Internet]. New York: Association of Cancer Online Resources [updated 16 May 2002; cited 9 July 2002]. Available from: *www.cancer-pain.org*

Tablolar

Tablolar metni tamamlayıcı olmalı, metin içerisinde tekrarlanan bilgiler içermemelidir. Metinde yer alma sıralarına göre Arabik sayılarla numaralandırılıp isimlendirilmelidir (örnek: Tablo-1). Tablonun üstüne tablo ismini takip eden kısa ve açıklayıcı bir başlık yazılmalıdır. Tabloda yer alan kısaltmalar, tablonun hemen altında açıklanmalıdır. Dipnotlarda sırasıyla şu semboller kullanılabilir: *, †, ‡, §, ¶.

Şekiller

Çizim, resim, grafik ve fotoğrafların tümü "Şekil" olarak adlandırılmalı ve ayrı birer dosya olarak (.jpg, .png, .tif vb., en az 300 dpi çözünürlükte) sisteme eklenmelidir. Şekil dosyaları yüksek çözünürlükte ve iyi kalitede olmalıdır. Şekiller metin içinde kullanım sıralarına göre parantez içinde Arabik rakamla numaralandırılmalıdır (örnek: Şekil-1).

Şekil Alt Yazıları

Şekil alt yazıları, şekillere karşılık gelen Arabik rakamlarla çift aralıklı olarak yazılmalıdır. Şeklin belirli bölümlerini işaret eden sembol, ok veya harfler kullanıldığında bunlar alt yazıda açıklanmalıdır. Başka yerde yayınlanmış olan şekiller kullanıldığında, yazarın bu konuda izin almış olması, bunu belgelemesi ve alt yazıda belirtmesi gerekir.

Ölçümler ve Kısaltmalar

Yazının hazırlanması bölümünde "Genel biçim" başlığı altında açıklanmıştır.

<u>**Başvuruda Yüklenecek Belgeler**</u>
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REVİZYONLAR

Yazarlar makalelerinin revizyon dosyalarını gönderirken ana metin üzerindeki değişiklikleri işaretlemeli, ek olarak hakemler tarafından belirtilen önerilerle ilgili notlarını "Hakemlere Yanıt" dosyasından göndermelidir. Bu dosyada her hakemin yorumunun ardından yazarın yanıtı gelmeli ve makalede değişikliklerin yapıldığı yer de belirtilmelidir. Revize makaleler karar yazısını takip eden 21 gün içinde dergiye gönderilmelidir.

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Original Articles comprise original research reporting new information on contemporary issues. These studies might be randomized controlled, observational, descriptive, methodological, clinical, experimental or animal studies. They should not exceed 3000 words excluding the abstracts and table/figure captions.

Case Reports should present an important finding, or rare, interesting case or condition or a novel approach to diagnosis or treatment. They should have a maximum of five authors and should not exceed 1000 words excluding the references and have at most 10 references. It may be accompanied by one figure or one table.

Clinical Image should include a high quality original and interesting image considered as valuable for education. It should have at most five authors, five references and a figure (photography, image,

drawing, graphic, etc.). It should not exceed 500 words excluding the references and the figure caption should not exceed 100 words.

Technical Note should describe a new and original application, technique, tool or device developed for educational, research, diagnostic or curative purposes. It should have at most five authors, five references and a figure (photography, image, drawing, graphic, etc.) or a table. It should not exceed 500 words excluding the references and if present, the figure or table caption should not exceed 50 words.

Letter to the Editor should not exceed 500 words. Short relevant comments on published articles, medical and scientific issues, particularly controversies, having no more than five references and one table or figure are encouraged. Where letters refer to an earlier published paper, authors will be offered the right to reply.

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All articles submitted to the Journal must comply with the following instructions:

General format

a- The text should be doubled-spaced and typed in Arial 10 points,

b- Page margin width should be 2.5 cm,

c- All pages should be numbered consecutively in the top right-hand corner and line numbers must be added beginning with the title page.

d- Abbreviations should first be stated openly, followed by the abbreviation in () brackets and the same abbreviation should be used throughout the text. Abbreviations should be avoided in the Title and Abstract and care should be given to prevent unnecessary abbreviations. Sentences should not start with abbreviations.

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f- All measure units should be according to the metric system (International System of Units, SI). E.g. mg/kg, µg/kg, mL/min, µL/h, mmHg etc. Measures and statistical data should be presented with numbers unless at the beginning of the sentence.

g- If applied, the statistical methods should be stated in the Materials and Methods section.

h- All numbers smaller than 10 not representing a unit should be written as words. Decimals should be separated by points in English texts and by commas in Turkish texts.

i- The text should be organized under the headings described for the relevant types of manuscript.

Cover Letter

The editor should be informed with the title of the manuscript, type of the manuscript, a brief description on the reasons why the relevant submission should be published in Ege Journal of Medicine, along with the responsible author stated, and all authors' names, ORCID numbers, institutions and contact information (phone numbers, e-mail and s-mail addresses) provided. A statement assuring that the manuscript is not submitted, accepted or published elsewhere should be written. Even though its language is might be different, Ege Journal of Medicine does not accept manuscripts published or accepted elsewhere.

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Keywords

At least three and at most five keywords in order of importance for indexing purposes should be supplied below the abstract and should be selected from, *Index Medicus Medical Subject Headings* (MeSH), available at *https://www.nlm.nih.gov/mesh/MBrowser.html*

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Tkacova R, Toth S, Sin DD. Inhaled corticosteroids and survival in COPD patients receiving long-term home oxygen therapy. Respir Med 2006;100(3):385-92.

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Acknowledgements

The source of financial grants and the contribution of colleagues or institutions should be acknowledged.

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Tables should be complementary, but not duplicate information contained in the text. Tables should be numbered consecutively in Arabic numbers, with a descriptive, self-explanatory title above the table. All abbreviations should be explained in a footnote. Footnotes should be designated by symbols in the following order: *,†, ‡, §, ¶.

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Abbreviations that are used should be defined in parenthesis where the full word is first mentioned. Some common abbreviations can be used, such as *iv*, *im*, *po,* and *sc.*

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