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Assessment of Anemia Situation in the Elderly Who Attend Health Care at Home

Evde Sağlık Hizmetlerine Başvuran Yaşlı Hastalarda Anemi Sıklığı ve MCV Değerlerinin Sosyodemografik Değişkenler ve Sağlık Durumuna Göre Dağılımı

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ABSTRACT

Aim: This study aims to investigate the frequency and morphologic distribution of anemia and the relationship of anemia with socio-demographic variables, the state of chronic disease, and drug use in the patients at the age of 65 and older who have been receiving home care service. **Method:** This cross-sectional was carried out between August 2011 and September 2012 and the study population involved 194 patients aged 65 years or older without a terminal disease. Socio-demographic data form, which was standardized for home care services by the Ministry of Health was employed and laboratory data were investigated by patient files. The presence of Anemia was evaluated in accordance with the definition of WHO. **Results:** Total 194 persons, 121 women and 73 men with ages ranging from 65 to 104 were included in the study. The mean age is 75,0±16,0 years. 58.2% (113) of the cases involved in the study were diagnosed with anemia. Of the anemic cases 18.6%(n=21) were hypochromic, 78.8% (n=89) were normochromic, and 2.7% (n=3) macrocytic anemia. Sedimentation rate and CRP level of the patients with anemia were significantly higher than those of without anemia (p>0.05). The rate of being bedridden and of using a bed with an air-bearing pad of the anemic cases were also statistically significantly higher than that of without anemia (p<0,05). Regarding MCV classification for patients with anemia, the mean of medication intake, CRP measurement values, use of bed with air-bearing pad, the frequency of neurological diagnosis was found out to be significantly higher in normochromic group cases in comparison to hypochromic and macrocytic group cases (p>0.05). **Conclusion:** Anemia is quite common in the elderly benefitting from home health care services and the vast majority has the anemia of chronic disease, inflammation induced anemia or unexplained anemia. Iron deficiency is the most important and the most frequent one among nutritional anemias. The evaluation of elderly patients receiving home care services in terms of anemia is important to give appropriate treatment that will positively affect their quality of life and it will also hinder the complications associated with anemia

Key words: elderly, home health care, anemia, chronic disease anemia

ÖZET

Amaç: Evde sağlık hizmeti almakta olan 65 yaş ve üstü hastalarda anemi sıklığı ve morfolojik dağılımı ile anemi ilişkisinin sosyodemografik değişkenler, kronik hastalık durumu ve ilaç kullanımı ile ilişkisi araştırılması. Bu kesitsel çalışma, Ağustos 2011 ile Eylül 2012 arasında gerçekleştirildi. Çalışma popülasyonu, 65 yaş ve üzeri, terminal hastalığı olmayan Evde sağlık birimine kayıtlı 194 hasta ile yapıldı. Sağlık Bakanlığı tarafından evde sağlık hizmetleri için standardize edilen sosyo-demografik veri formu ve laboratuvar verileri kullanıldı. Anemi varlığı WHO'nun tanımına göre değerlendirildi. **Bulgular:** Çalışmaya toplam 194 kişi, yaşları 65 ile 104 arasında değişen 121 kadın ve 73 erkek alındı. Yaş ortalaması 75,0 ± 16,0'dır. Çalışmaya dahil edilen kişilerin % 58.2'si (113) anemiyle teşhis edildi. Anemik olguların%18.6'sı (n = 21) hipokrom, %78.8'i (n = 89) normokrom, %2.7'si (n = 3) makrositik anemi idi. Anemili hastaların sedimentasyon hızı ve CRP düzeyi anemisi olmayanlara göre daha yüksek bulundu (p> 0.05). Anemik olguların hava yastığı ile yatak yatağı kullanma ve yatak başı olma oranı da anemi olmaksızın istatistiksel olarak anlamlı derecede yüksekti (p <0,05). Anemi hastaları için MCV sınıflaması ile ilgili olarak, hipokromik grup ve makrositik grup vakalarına kıyasla normokromik grup olgularında ilaç alımı ortalaması, CRP ölçüm değerleri, hava yastığı ile yatak kullanımı, nörolojik tanı sıklığı anlamlı olarak daha yüksek bulundu (p <0.05). **Sonuç:** Evde sağlık hizmetlerinden yararlanan yaşlılarda demir eksikliği anemisini oldukça yaygındır ve büyük çoğunluğu kronik hastalık, inflamasyon, GİS malignite veya açıklanamayan anemiye sahiptir. Demir eksikliği, nutrisyonal anemiler arasında en önemli ve en sık görülenidir. Yaşlıların anemi açısından değerlendirilmesi, yaşam kalitesini olumlu yönde etkileyebilecek uygun bir tedavi sağlanması açısından önemlidir ve aynı zamanda anemi ile ilişkili komplikasyonları da engelleyecektir.

Anahtar kelimeler: Yaşlılık, evde sağlık, anemi, kronik hastlalık anemisi

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BACKGROUND

Age groups admitted to home health care services are mostly the elderly patients at age 65 or older who are requiring chronic and long-term care and also all age groups with chronic disease, babies, and children. In 1988, those who received home health care services at the age of 65 years or older comprised 83%in Austria, 83% in Germany, and 63% in the USA.[1]

According to the results of Turkish Statistical Institute address-based population registration system, population at the age of 65 and older in Turkey rose to a rate 8,5% (6.895385 persons) as of the date of 2017 .[2] When these figures are considered, the number of elderly people benefiting from home health care services is expected to be on the increase. Through the exercise of home health care services in public, the restructuring of home health care services in our country have come with some new additional problems to be solved in terms of medical doctors working in this field. As stated in the literature, mostly the elderly, who are described as people over 65 years, constitute the majority of the population receiving health care services in their homes and the majority of those people are frail elderly people who are multi-drug users and are with multiple chronic diseases.[3]

Anemia is one of the important health problems in elderly people and the health care cost of anemic patients is twice more than that of those who are with similar comorbid diseases. Untreated anemia is related to tiredness, functional limitation, and impairment of health and it leads to cardiovascular and neurological complications and is also an independent risk factor for increased mortality.[4]

In previous studies, anemia prevalence was quite variable due to the places where the studies were conducted – home, hospital, polyclinic, nursing home, health condition of the participants, and the differences of criteria in the definition of anemia and the reported rates have ranged between 2,9% - 61%in males and 3,3 % -41% in females. Whereas in international literature, anemia prevalence has been reported as 10% among community-dwelling elderlies, it has been raising to rate greater than 20% at age 85 and older. Prevalence is higher in those who are staying in the nursing home, who are hospitalized, and with advanced age.[5] Though, in our country, there have been a number of studies covering anemia prevalence in the elderly, a study on the elderly receiving home health care service does not exist.

AIMS

The present study aims to investigate 1) the frequency of anemia 2) morphological distribution regarding MCV and 3) the relationship of anemia with socio-demographic variables, the state of chronic disease, and drug use in the patients at the age of 65 and older who have been receiving home care service.

METHODS

This cross-sectional was carried out between August 2011 and September 2012 and the study population involved 194 patients aged 65 years or older without terminal disease, admitted to Taksim Training and Research Hospital – Home Healthcare Unit and aged 65 years or older. Taksim Training and Research Hospital - Home Healthcare Unit has been providing service since 2011. In its region, the unit has been serving not only for the elderly requesting home care service in their homes but also for those who are staying in the nursing home under the management of Association for Assistance to the Elderly and are in need of healthcare service. Although the people with the ability of self-care are accepted to the concerning nursing home, until terminal period, or in the case of adventitious Alzheimer's disease, the caring of those people is provided in the same institute. Socio-demographic data form by Ministry of Health (MoH), which was standardized for home care services, was employed which includes the data such as age, gender, the status of being bedridden, use of assisting equipment, and attendant availability. Laboratory data were measured with ELECSYS 2010(Roche Diagnostics) Hormone analyzer by electrochemiluminescence method and by investigating patient files. Laboratory reference values of Taksim Training and Research Hospital were considered for laboratory lower and upper-value limits.

The presence of Anemia was evaluated in accordance with the definition of the World Health Organization (WHO). Hemoglobin values of 12 g/dl in women and 13g/dl in men and also hematocrit concentration level below 36% in women and 39%in men were evaluated as anemia. Since MCV plays a crucial role in most of the algorithms in classification of anemia, a morphological a classification was performed according to MCV.

Normal value of MCV was considered as 80-100 femtoliter (fl). The classification was made as: MCV<80 fl microcytic; MCV: 80-102 fl normocytic; MCV≥103 fl macrocytic.

Normal reference intervals of the patients were evaluated as ferritin 13-150ng/ml, Vitamin B12 191-663 pg/ml, and folic acid 3,1-17,5 ng/ml. Among those who were with low ferritin level were attributed to iron deficiency. Likewise, the patients with macrocytic anemia according to MCV and were with low Vitamin B12 or folic acid level were attributed to nutritional anemia.[6] Patients with normocytic anemia regarding MCV, were accepted as anemia of chronic disease or anemia of inflammation. The presence of anemia in the patients with chronic renal insufficiency was also attributed to anemia of chronic renal insufficiency.

1.1. Statistical Investigations

NCSS (Number Cruncher Statistical System), 2007&PASS (Power Analysis and Sample Size) 2008 Statistical Software (Utah, USA) Program were used for statistical analyses. During the evaluation of the data, in addition to the descriptive statistical methods (mean, standard deviation, median, frequency, ratio), Student t Test was employed for quantitative data and comparison of parameters with normal distribution. Kruskal Wallis test was used for 3-group comparisons of parameters with non-normal distributions while Mann Whitney U test was used for determination of the group leading to difference and for two-group comparisons. In comparing qualitative data Pearson Chi-Square Test was performed whereas Fisher's Exact Testand Yates Continuity Correction Test were used for identification of the group leading to distinction. Significance levels were considered as $p<0,01$ and $p<0.05$.

RESULTS

Total 194 persons, 121 women and 73 men with ages ranging from 65 to 104were included in the study. The mean age is 75,0±16,0 years. Socio-demographical characteristics of the cases have shown in Table 1.

Table 1. Demographical characteristics

		Min-Max	Mean±SD
Age (year)		65-103	75,0±16,0
		n	%
Gender	Men	121	62,4
	Women	73	37,6
The way of presenting to hospital	Physician in charge of discharge	1	0,5
	HospitalHomeCare Service Unit	184	94,8
	Family Physician	9	4,6
Need of Home Care Support		188	96,9
Social Security	Temporary Health Insurance	130	67,0
	Private Insurance	7	3,6
	Paid Service	7	3,6
	Green Card	23	11,9
	Other	27	13,9
Income Status	Receiving Salary	108	55,7
	Social Welfare Center	23	11,9
	Nursing Indigence Assistance	7	3,6
	No Income	19	9,8
	In care of Head of the Family	37	19,1

Table 2. Psychological state and chronic disease distribution of the patients

		n	%
Allergy		8	4,1
Psychological State	Normal	88	45,4
	Distressed	51	26,3
	Restless and Anxious	31	16,0
	Indifferent	24	12,3
Pain		65	33,5
Pressure ulcer		36	18,6
Neurological diagnosis		169	87,2
Cardiovascular diagnosis		88	45,4
Oncological diagnosis		32	16,5
Orthopedic and traumatological diagnosis		24	12,4
Chronic endocrine diagnosis		66	34,0
Lung disease and respiratory disorder diagnosis		44	22,7
Muscles and joint disease diagnosis		7	3,6
Frequency of Patient Follow-up (month)	Once in a month	122	62,9
	Bimonthly	47	24,2
	Quarterly	20	10,3
	Every four months	2	1,0
	Other	3	1,5

Of the patients 58.2% (113) of the cases involved in the study were diagnosed with anemia while 41,8%(81) were not. In 30 (15,5%) of all the cases ferritin level was found out to be low while low vitamin B12 and folic acid level were detected in 28 (14,4%) and 1 of the cases, respectively. Of the anemic cases 18.6%(n=21) were hypochromic, 78.8% (n=89) were normochromic, and 2.7% (n=3) macrocytic anemia. All hypochromic cases had low ferritin levels and nine cases with low ferritin levels had no anemia. Out of 28 cases with low Vit B12 levels only three had macrocytic anemia, 13 had normocytic anemia and 11 had no anemia at all. One case with low folic acid levels had normal hemoatocrit and hemoglobin values.

The presence of anemia, socio-demographic variables, and health state of the patients have shown in Table 3. Of the patients, 11,3% (n=22) were non-bedridden, 55,7%(n=108) were semi bedridden, and 33% (n=64) were bedridden. The number of drugs used by the patients range between 0 and 18 with a mean of 4,1±2,67.

Diagnostic distribution of the patients. Chronic renal failure is not detected in any of the patients included in the study. Sedimentation rate and CRP level of the patients with anemia were significantly higher than those of without anemia ($p>0.05$). The rate of being bedridden and of using bed with air-bearing pad of the anemic cases were also statistically significantly higher than that of without anemia ($p<0,05$).

Regarding MCV classification for patients with anemia, the mean of medication intake, CRP measurement values, use of bed with air-bearing pad, the frequency of neurological diagnosis were found out to be significantly higher in normochromicgroup cases in comparison to hypochromic and macrocytic group cases ($p>0.05$). The rate of the cases psychologically restless and anxious in hypochromic group was also found to be significantly higher than that of macrocytic and normochromic group ($p<0,05$). (Table 4)

Table 3. The relationship of anemia presence with socio-demographic variables, psychological states, and health statesof the patients

		Anemia		*p*
		Yes	No	
		Mean±SD	Mean±SD	
Age		75,1±15,1	74,9±17,3	[d]*0,9*
Number of Drugs		4,2±2,7 (4,0)	4,0±2,5 (4,0)	[e]*0,5*
Sedimantation		43,1±29,1 (45,0)	35,9±25,1 (26,0)	[e]*0,0*
CRP		23,6±37,9 (9,0)	11,4±18,4 (6,0)	[e]*0,0*
TSH		1,7±2,5 (1,00)	1,64±1,84 (1,00)	[e]*0,5*
		(n=113) (%)	(n=81) (%)	
Gender	Women	67 (%59,3)	54 (%66,7)	[a]*0,2*
	Men	46 (%40,7)	27 (%33,3)	
Income Status	Receiving Salary	71 (%62,8)	37 (%45,7)	[a]*0,0*
	Social Welfare Center	9 (%8,0)	14 (%17,3)	[c]*0,0*
	Nursing Indigence Assistance	2 (%1,8)	5 (%6,2)	[b]*0,2*
	No Income	9 (%8,0)	10 (%12,3)	[c]*0,4*
	In care of Head of the Family	22 (%19,5)	15 (%18,5)	[c]*1,0*
Status of Being Bedridden	Bedridden	45 (%39,8)	19 (%23,5)	[c]*0,0*
	Semi-Bedridden	57 (%50,4)	51 (%63,0)	[a]*0,0*
	Non-Bedridden	11 (%9,7)	11 (%13,6)	[c]*0,5*
Psychological State	Normal	48 (%42,5)	40 (%49,4)	[a]*0,3*
	Distressed	31 (%27,4)	20 (%24,7)	[c]*0,7*
	Restless and Anxious	21 (%18,6)	10 (%12,3)	[c]*0,3*
	Indifferent	13 (%11,5)	11 (%13,6)	[c]*0,8*
Supporting Devices being Used	No	11 (%9,7)	18 (%22,2)	[c]*0,0*
	Wheelchair	19 (%16,8)	11 (%13,6)	[c]*0,6*
	Walker	17 (%15,0)	11 (%13,6)	[c]*0,9*
	Bed with air-bearing pad	42 (%37,2)	17 (%21,0)	[c]*0,0*
	Dental plate	4 (%3,5)	3 (%3,7)	[b]*1,0*
	Toilet seat raiser	7 (%6,2)	7 (%8,6)	[c]*0,7*
	Crutch	3 (%2,7)	4 (%4,9)	[b]*0,4*
	Prosthesis	10 (%8,8)	10 (%12,3)	[c]*0,5*
Need of Home Care Support (Yes)		110 (%97,3)	78 (%96,3)	[b]*0,6*
Personal Hygiene (Available)		81 (%71,7)	63 (%77,8)	[c]*0,4*
Chronic Disease (Yes)		65 (%57,5)	48 (%59,3)	[a]*0,8*
Prior Diseases(Yes)		56 (%49,6)	38 (%46,9)	[a]*0,7*
Allergy (Yes)		3 (%2,7)	5 (%6,2)	[b]*0,2*
Pain (Yes)		40 (%35,4)	25 (%30,9)	[a]*0,5*

Table 3. The relationship of anemia presence with socio-demographic variables, psychological states, and health statesof the patients (continued)			
Pressure ulcer(Yes)	26 (%23,0)	10 (%12,3)	[c]*0,0*
Neurological finding(Yes)	97 (%85,8)	72 (%88,9)	[c]*0,6*
Cardiovascular diagnosis(Yes)	55 (%48,7)	33 (%40,7)	[a]*0,2*
Oncological diagnosis(Yes)	22 (%19,5)	10 (%12,3)	[c]*0,2*
Orthopedic and traumatological diagnosis (Yes)	19 (%16,8)	5 (%6,2)	[c]*0,0*
Chronic endocrine diagnosis(Yes)	42 (%37,2)	24 (%29,6)	[c]*0,3*
Lung disease and respiratory disorder diagnosis(Yes)	26 (%23,0)	18 (%22,2)	[c]*1,0*
Muscles and joint disease diagnosis(Yes)	4 (%3,5)	3 (%3,7)	[b]*1,0*

[a]*Pearson Chi-Square* [b]*Fisher's Exact Test* [c]*Yates Continuity Correction*
[d]*Student-T Test* [e]*Mann-Whitney U Test* **p<0,05*

Table 4. The relationship of morphological classification of anemia considering MCV with socio-demographic variables, psychological and health states of the patients with anemia

		MCV			
		Hypochromic	Normochmi	Macrocytic	
		Mean±SD	Mean±SD	Mean±SD	
Number of Drugs		2,9±1,6 (3,0)	4,6±2,9 (4,00)	2,6±0,5 (3,0)	[g]*0,0*
Sedim		35,4±25,3 (25,0)	52,5±29,2 (48,0)	43,6±32,3 (25,0)	[f]*0,05*
CRP		14,0±31,2 (3,0)	26,3±39,6 (10,0)	10,3±10,1 (5,0)	[f]*0,0*
TSH		1,76±3,3 (1,0)	1,3±2,2 (1,00)	4,3±4,0 (2,0)	[f]*0,1*
		(n=21) (%)	(n=89) (%)	(n=3) (%)	
Gender	Women	15 (%71,4)	51 (%57,3)	1 (%33,3)	[a]*0,3*
	Men	6 (%28,6)	38 (%42,7)	2 (%66,7)	
Status of Being Bedridden	Bedridden	5 (%23,8)	39 (%43,8)	1 (%33,3)	[a]*0,2*
	Semi-Bedridden	14 (%66,7)	41 (%46,1)	2 (%66,7)	[a]*0,2*
	Non-Bedridden	2 (%9,5)	9 (%10,1)	0 (%0,0)	[a]*0,8*
Psychological State	Normal	6 (%28,6)	39 (%43,8)	3 (%100,0)	[a]*0,0*
	Distressed	4 (%19,0)	27 (%30,3)	0 (%0,0)	[a]*0,3*
	Restless and Anxious	8 (%38,1)	13 (%14,6)	0 (%0,0)	[a]*0,0*
	Indifferent	3 (%14,3)	10 (%11,2)	0 (%0,0)	[a]*0,7*

Table 4. The relationship of morphological classification of anemia considering MCV with socio-demographic variables, psychological and health states of the patients with anemia ((continued)

Support Devices being Used	No	4 (%19,0)	7 (%7,9)	0 (%0,0)	[a]*0,2*
	Wheelchair	4 (%19,0)	14 (%15,7)	1 (%33,3)	[a]*0,6*
	Walker	6 (%28,6)	10 (%11,2)	1 (%33,3)	[a]*0,0*
	Bed with air-bearing pad	3 (%14,3)	39 (%43,8)	0 (%0,0)	[a]*0,0*
	Dental plate	1 (%4,8)	3 (%3,4)	0 (%0,0)	[a]*0,9*
	Toilet seat raiser	1 (%4,8)	6 (%6,7)	0 (%0,0)	[a]*0,8*
	Crutch	0 (%0,0)	2 (%2,2)	1 (%33,3)	[a]*0,0*
	Prosthesis	2 (%9,5)	8 (%9,0)	0 (%0,0)	[a]*0,8*
Need of Home Care Support (Yes)		21 (%100,0)	86 (%96,6)	3 (%100,0)	[a]*0,6*
Personal Hygiene (Available)		16 (%76,2)	62 (%69,7)	3 (%100,0)	[a]*0,4*
Chronic Disease (Yes)		10 (%47,6)	55 (%61,8)	0 (%0,0)	[a]*0,0*
Prior Diseases(Yes)		6 (%28,6)	49 (%55,1)	1 (%33,3)	[a]*0,0*
Allergy (Yes)		0 (%0,0)	3 (%3,4)	0 (%0,0)	[a]*0,6*
Pain (Yes)		13 (%61,9)	58 (%65,2)	2 (%66,7)	[a]*0,9*
Pressure ulcer(Yes)		2 (%9,5)	24 (%27,0)	0 (%0,0)	[a]*0,1*
Neurological finding(Yes)		18 (%85,7)	78 (%87,6)	1 (%33,3)	[a]*0,0*
Cardiovascular diagnosis(Yes)		11 (%52,4)	43 (%48,3)	1 (%33,3)	[a]*0,8*
Oncological diagnosis(Yes)		2 (%9,5)	20 (%22,5)	0 (%0,0)	[a]*0,2*
Orthopedic and traumatological diagnosis (Yes)		1 (%4,8)	17 (%19,1)	1 (%33,3)	[a]*0,2*
Chronic endocrine diagnosis(Yes)		7 (%33,3)	35 (%39,3)	0 (%0,0)	[a]*0,3*
Lung disease and respiratory disorder diagnosis(Yes)		4 (%19,0)	22 (%24,7)	0 (%0,0)	[a]*0,5*
Muscles and joint disease diagnosis(Yes)		1 (%4,8)	3 (%3,4)	0 (%0,0)	[a]*0,9*

[a]*Pearson Chi-Square* [b]*Fisher's Exact Test* [c]*Yates Continuity Correction*

[g]*Oneway Anova* [f]*Kruskal-Wallis* *$p<0,05$

DISCUSSION

In III. National Health and Nutrition Examination Survey, the frequency of anemia in the elderly was stated as 11% in men and 10.2% in women regarding WHO criteria and also the rates showed increase for the age of over 85 as 26% and21%, respectively. Prevalence is higher in those with advanced age, staying in nursing home and hospital.[7]

Various results were reported by studies carried outin different countries on anemia prevalence in the elderly. In the studies administeredin the United States, for instance, Dallman et al. found anemia prevalence as 8,3% (4,4% in men, 3,9% in women) in 1858 elderly people; Timiras et al. reported therate as 26,1% (17,7% in men, 8,4% in women) in their study with

1024 patients over the age of 60 while the rate was found as 27,8% (15,2% in men, 12,6% in women) by Salive et al. in their study with 3946 people aged 71 years and older.[8,9]In another study carried out in Belgium by Jooesten et al., anemia was established in24% of 728 geriatric patients who were hospitalized.[10]

Likewise, in Israel, Chernetsky et al. found the rate of anemia as 31,4% for hospitalized geriatric patients and also stated that the most frequent reason of anemia was chronic disease (65,6%).[11]

A previous study on anemia prevalence in the elderly which was conducted by Çoban et al. in Turkey concluded that 25% of 1388 out patients aged 65 and over had anemia.[12]

There is not a study involving only the elderly receiving home care service in our country. The previous studies were conducted with the community-dwelling elderly. Anemia rate in the present study is 58,2%, which reveals that general health conditions of the elderly receiving home care service is worse. 33% of the patients were bedridden where as 57,7% were semi-bedridden. Higher anemia rate of this population having high multi-morbidity rate than that of general society is not surprising. Anemia is associated with increased mortality and morbidity in the elderly and influences life quality in a negative way. It restricts movement of the community-dwelling elderly, causes tiredness, and increases depression, dementia, and falling down.[13] Thus, the determination of anemia and, if possible, its treatment and optimization of hemoglobin levels are important. Anemia in the elderly is classified under three main titles unlike other age groups: un explained anemia, nutritional deficiency, chronic inflammation or disease. In this study when the variables are taken into account, particularly the state of being bedridden, sedimentation, and high CRP is associated with anemia and also it is observed more often in those who are bedridden and are with inflammation. Bearing all the gathered data in mind, the majority of the anemic patients included in the study fall into chronic disease/inflammation-induced anemia or unexplained anemia group. The studies conducted within community containing the elderly not staying in institution, nutritional anemia, chronic disease or inflammation-induced anemia, and unexplained anemia distribution rate is one third each.[14]

Vitamin B12 deficiency in nutritional anemia needs to be evaluated very carefully. The studies on pernicious anemia were associated with lower vitamin B12 and anemia determined in the community.Therefore, the measurement of vitamin B12 and the treatment by vitamin B12 intramuscular injection when it is deficient has become conventional.[15]However, the recent evidences showed tendency towards not to associate general population-based slightly subnormalvitamin B12 levels with anemia as it was in those who were seriously B12 deficient.In a Leiden-85 plus study including the elderly over 85 years old, they did not find anassociation between subnormal vitamin B12 and anemia.[16]

Similarly, in the present study, the rate of those who are anemic and non-anemic with low B12 level is close to each other and is not statistically significant. Megaloblastic anemia was established only in three persons in the vitamin B12 deficient group.

Also, in other studies it had been reported that low level of vitamin B12 was not associated with anemia and replacement therapy did not improve hemoglobin levels.[17]

Therefore, those data have been in favour of the idea that low level of vitamin B12 in the elderly may not necessarily be associated with anemia. One of the most common causes of anemia in the elderly is the iron deficiency and its frequency has been fore seen approximately >%15. Ferritin levels are considered as the best criteria in establishing diagnosis. Ferritin is an acute phase reactant as well and it increases during acute and chronic inflammation. It may not mirror the iron store exactly in acute inflammation, but the study of Leiden 85-plus has showed that ferritin measurement is very important for the persons with inflammation. Low ferritin levels have been associated with low hemoglobin levels and MCV and therefore, this association has been more significant with the ones with inflammation. The researchers inferred that low ferritin in the persons with inflammation was particularly important as “acute phase” reactant and that establishment of low ferritin accompanied by inflammation was expected to result in un favorable iron levels.[18]

Considering the relevant data, it might be stated that iron deficiency is actually present in the patient group with low ferritin and that even if there possibly co exists chronic disease anemia to a certain extent, those patients will benefit from replacement and that iron deficiency constitutes an important part of nutritional anemia in the elderly.

The majority of anemia cases in the current study are normocytic anemia, which has been observed more often in the event of multi-drug intake, sedimentation, and increased CRP levels. Chronic renal failure has not been identified in any of ourcases. The evidences are suggestive of the idea that the majority of the patients in the group fall into the anemia of chronic disease and inflammation

group. Normocyticanemia group usually consists of chronic disease anemia, cancers, diseases associated with bone marrow and unexplained anemia of elderly.[19]

Altough in order for certain distinction, more detailed evaluation is needed, high rate of chronic disease anemia in this specific group is an expected result when it is considered that most of the patients receiving home health care services have at least one and sometimes more than one chronic disease.

The present study has its limitations as well. First, it has been conducted in a single home health care center with a low number of samples and therefore, the results cannot be generalized for a region or society. It has not been reflecting the prevalence exactly in the society. Secondly, due to the lack of advanced evaluation opportunity, anemia etiology could not be defined clearly, particularly in normocytic anemia group.

CONCLUSION

Our society has been getting older and the majority of people receiving homecare services are the elderly and thus the number of people receiving this service is expected to be on the increase. Anemia is quite common in the elderly benefitting from home health care services and the vast majority has the anemia of chronic disease, inflammation-induced anemia or unexplained anemia. Iron deficiency is the most important and the most frequent one among nutrituonal anemias. In brief, when negative effects of anemia both on general health conditions and frailty of the elderly are taken into account, the evaluation of elderly patients receiving home care services in terms of anemia is crucial. Their appropriate treatment will positively affect their quality of life and it will also hinder the complications associated with anemia.

Competing Interest

The authors declare that they have no competing interests.

REFERENCES

1. Joosten E, Pelemans W, Hiele M, Noyen J, Verhaeghe R, Boogaerts MA Prevalence and causes of anaemia in a geriatric hospitalized population. Gerontology 1992: 38: 111-117.
2. Türkiye İstatististik Kurumu www.tuik.gov.tr accessed in 15 March 2018.
3. Nissenson AR, Wade S, Goodnough T et al. Economic burden of anemia in an insured population. J Manag Care Pharm. 2005:11(7):565-574
4. Woodman R, Ferrucci L, Guralnik J. Anemia in older adults. Curr Opin Hematol.2005: 12(2):123-8. Review.
5. Pang WW. Anemia in the elderly. Curr Opin Hematol.2012: 19(3):133-40.
6. Steensma DP, Tefferi A. Anemia in the elderly: how should we define it, when does it matter, and what can be done? Mayo Clin Proc. 2007:82(8):958-966.
7. Chaves PH. Functional outcomes of anemia in older adults. Semin Hematol.2008: 45(4):255-60.
8. Dallman PR, Yip R, Johnson C. Prevalence and causes of anemia in the United States, 1976 to 1980. Am J Clin Nutr.1984: 39: 437- 445.
9. Salive ME, Cornoni-Huntley J, Guralnik JM, Phillips CL, Wallace RB, Ostfeld AM, Cohen HJ. Anemia and hemoglobin levels in older persons: relationship with age, gender, and health status. J Am Geriatr Soc.1992:40: 489-496.
10. Joosten E, Pelemans W, Hiele M, Noyen J, Verhaeghe R, Boogaerts MA Prevalence and causes of anaemia in a geriatric hospitalized population. Gerontology 1992: 38: 111-117
11. Chernetsky A, Sofer O, Rafael C, Ben-Israel J. Prevalence and etiology of anemia in an institutionalized geriatric population. Harefuah 2001:141: 591-594.
12. Coban E, Timuragaoglu A, Meric M. Iron deficiency anemia in the elderly: prevalence and endoscopic evaluation of the gastrointestinal tract in outpatients. Acta Haematol. 2003:110: 25-28.
13. Salive ME, Cornoni-Huntley J, Guralnik JM, Phillips CL, Wallace RB, Ostfeld AM, Cohen HJ. Anemia and hemoglobin levels in older persons: relationship with age, gender, and health status. J Am Geriatr Soc.1992:40: 489-496.
14. Guralnik JM, Eisenstaedt RS, Ferrucci L, Klein HG, Woodman RC. Prevalence of anemia in persons 65 years and older in the United States: evidence for a high rate of unexplained anemia. 2004: 104(8):2263-2268.
15. Andrès E, Loukili NH, Noel E, Kaltenbach G, Abdelgheni MB, Perrin AE, Noblet-Dick M, Maloisel F, Schlienger JL, Blicklé JF. Vitamin B12 cobalamin deficiency in elderly patients. CMAJ 2004:3;171(3):251-9
16. Den Elzen WP, Westendorp RG, Frolich M, de Ruijter W, Assendelft WJ, Gussekloo J. Vitamin B12 and folate and the risk of anemia in old age: the Leiden 85-Plus Study. Arch Intern Med.2008: 168(20):2238-44.
17. Seal EC, Metz J, Flicker L, Melny J. A randomized, double-blind, placebocontrolled study of oral vitamin B12 supplementation in older patients with subnormal or borderline

serum vitamin B12 concentrations. J Am Geriatr Soc. 2002:50(1):146-51.
18. Den Elzen WP, Gussekloo J, Willems JM, et al. Predictive value of low ferritin in older persons with anemia with and without inflammation: the Leiden 85-plus Study. J Am Geriatr Soc.2010 :58(8):1601-3.
19. Den Elzen WP, Gussekloo J. Anemia in older persons. Journal of Medicine 2011: 9(6): 260-7.