The frequency of anemia in the elderly patient population in Van province, Turkey. A cross-sectional study

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Abstract

Aim: This study aims to determine the prevalence and morphological distribution of anemia among elderly patients who presented to the hospital during a certain time period.

Materials and Methods: Haemogram parameters of all patients aged 60 or older who attended our hospital for any reason during a certain time period were reviewed. Anemia was defined according to the criteria by the World Health Organization (WHO). Cases of anemia were classified based on the mean corpuscular volume (MCV) results of the patients as microcytic, normocytic, or macrocytic. The prevalence and morphological classification of anemia were examined with respect to age and gender.

Results: Of 1192 total patients, 608(51%) were female. The majority of the patients were in the 60−70−year range, with a rate of 60.3% (718). The mean age was 69.70±7.55 years in females and 69.8±7.15 in males (p=0.680). Anemia was detected in 340 (28.5%) patients in total (24.8% in females, 32.4% in males, p=0.004). Sixty−six (19.4%) patients had microcytic anemia, 245(72.1%) had normocytic anemia, and 29 (8.5%) had macrocytic anemia. Distribution of anemia across age groups revealed 169 (23.5%) patients with anemia in the 60−70−years age group (69 (%18.2) vs 100 (%29.6), p=0.001). The prevalence of anemia was different between genders in both the 60−70−years and ≥81 years groups (respectively, 52 (%14.6) vs 66 (%18.5), p=0.426 and 30 (%25.6) vs 23 (%19.7), p=0.295).

Conclusion: The prevalence of anemia increases with aging. Determination of the prevalence and the etiological distribution of anemia, particularly in the elderly patient group, may provide practical information in daily practice regarding the approach to be adopted towards patients in a certain region. We think that these results provide information on the epidemiology of anemia among elderly patients in the specified region and will contribute to future studies in this aspect.

Keywords: Aging; anemia; anemia in the elderly; elderly

INTRODUCTION

According to the World Health Organization (WHO), anemia is defined as a hemoglobin level lower than 12 g/dl in females and 13 g/dl in males (1). Although it used to be considered as a natural consequence of aging in the past, many current studies indicate that anemia reflects a deterioration of health status and leads to unfavorable consequences if not treated (2). It is a common health problem among elderly patients and its prevalence increases with aging. Particularly, the prevalence of anemia among patients aged 85 years or older was reported as 27−40% in males and 16−21% in females (3).

Anemia was shown to negatively impact life quality and functioning in elderly patients. In particular, it impairs physical and cognitive functioning, and increases the risk of mortality in patients with comorbid conditions; while also elevating the treatment cost due to requiring frequent and long−term hospitalization (4).

The prevalence of anemia among the elderly can be quite variable. Various factors such as comorbid conditions, experimental conditions (home, hospital or polyclinic conditions etc.), and the criteria adopted to define anemia can influence the prevalence of anemia (5). While the cause of anemia is identifiable in the majority of elderly patients, there are also patients who present with unexplained anemia (6).

The two most common causes of anemia in the elderly population are; anemia of chronic disease or inflammation (including chronic infections and malignancies) and nutritional anemia (iron deficiency, vitamin B12 and folic acid deficiency, etc.). Further, certain hematological diseases that become more prevalent with aging such

as myelodysplastic syndrome, which is encountered in elderly patients, are among important causes of anemia (7,8).

In this cross-sectional study, we aimed to determine the prevalence of anemia among elderly patients who presented to the hospital during a certain time period and the distribution of anemia according to morphological classification.

MATERIALS and METHODS

Patients

This study included all patients aged 60 or above who attended Yuzuncu Yil University, Faculty of Medicine polyclinics for any reason during a certain time period. Patients with active acute bleeding, patients on chemotherapy for hematologic and solid organ malignancies, and patients on iron, vitamin B12 or folic acid supplements were excluded from the study.

Laboratory Tests

Haemogram results of the remaining patients in the target population were considered to indicate anemia if the hemoglobin level was lower than 12 g/dl for females and 13 g/dl for males. Anemia is morphologically classified according to mean corpuscular volume (MCV) results. According to the reference ranges of our hospital: MCV values of 77 femtoliters (fL) or lower were classified as microcytic anemia, 78–95 fL as normocytic anemia, and 96 fL or higher as macrocytic anemia. Complete blood count and parameters were measured using the hemoglobin spectrophotometry method and cell impedance method via Beckman Coulter LH 780 blood count device, in all patients. Demographic data and laboratory results of all patients included in the study were recorded.

The study was approved by the research ethics committee of Yuzuncu Yil University, Faculty of Medicine (date/reference number: 16.02.2018/003). All analyses were performed in accordance with the principles of the Declaration of Helsinki.

Statistical Analysis

Statistical analysis was performed using SPSS 22.0 (SPSS Inc., Chicago, IL, USA). For relevant characteristics, descriptive statistics were presented as mean, standard deviation, minimum and maximum values, while categorical variables were presented in the form of frequency and percentages. One-way ANOVA was used in the comparison of group means of continuous variables. Pearson correlation coefficient was computed in order to determine the correlation between these variables. Chi-square test was used to determine the relationship between the groups and categorical variables. Statistical significance was defined as $p<0.05$.

RESULTS

A total of 1192 patients aged 60 or older who presented during the six-month period were evaluated with regard to anemia. Of these patients, 608 (51%) were female and 584 (49%) were male. The age distribution of the patients was as follows; 718 (60.3%) patients aged between 60–70 years, 357 (29.9%) patients aged between 71–80 years, 117 (9.8%) patients older than 80 years. Demographic data of the patients are presented in Table 1.

Table 1. Demographic data of all patients	
Characteristics	**n (%)**
Gender, n (%)	
Female	608 (51)
Male	584 (49)
Age, year	
60–70 years	718 (60.3)
71–80 years	357 (29.9)
≥81 years	117 (9.8)
Anemia status, n (%)	340 (28.5)
Female	151 (24.8)
Male	189 (32.4)

Table 2. Evaluation of anemia according to gender, age and morphological distribution			
Parameters	**Female patients (N=608)**	**Male patients (N=584)**	**P value**
Age, year			0.680
Mean ± SD	69.70 ± 7.55	69.87 ± 7.15	
Range	60 – 99	60 – 89	
Hemoglobin, gr/dl			**0.001**
Mean ± SD	13.08 ± 1.89	13.71 ± 2.4	
Range	5.6 – 17.6	6.7 – 21.4	
Mean corpuscular volume, fl			**0.001**
Mean ± SD	84.98 ± 6.32	87.15 ± 7.28	
Range	62.3 – 106	62.1 –136	
Anemia status (morphological), n (%)	151 (24.8)	189 (32.4)	**0.004**
Microcytic	32 (21.2)	34 (18)	
Normocytic	110 (72.8)	135 (71.4)	
Macrocytic	9 (6)	20 (10.6)	
Anemia status by age, n (%)			
60–70 years	69 (18.2)	100 (29.6)	**0.001**
71–80 years	52 (14.6)	66 (18.5)	0.426
≥81 years	30 (25.6)	23 (19.7)	0.295

Mean age was 69.70±7.55 years in females and 69.8±7.15 in males, with no significant difference between genders (p=0.680). Mean hemoglobin level was found as 13±1.89 gr/dl in females and as 13.7±2.24 gr/dl in males, with a significant difference between genders (p=0.001). Mean MCV was higher in males than in females with a significant difference (84.98±6.32 vs 87.15±7.28 fl, p=0.001).

Anemia was determined in 340 patients (28.5%) in total. Rate of anemia was 24.8% in females and 32.4% in males, and the prevalence of anemia was significantly different between genders (p=0.004). The morphological distribution of anemic patients was examined based on MCV values. Accordingly, 66 (19.4%) patients had microcytic anemia, 245 (72.1%) had normocytic anemia, and 29 (8.5%) had macrocytic anemia. Among anemic females, 32 (21.2%) had microcytic anemia, 110 (72.8%) normocytic anemia, and 9 (6%) macrocytic anemia. Among anemic males, 34 (18%) had microcytic anemia, 135 (71.4%) normocytic anemia, and 20 (10.6%) macrocytic anemia.

Distribution of anemia across age groups revealed 169 (23.5%) anemic patients in the 60–70–years age group, with a significant difference between genders (69 (%18.2) vs 100 (%29.6), p=0.001). The prevalence of anemia was different between genders in both the 60–70–years and ≥81 years groups, however, these differences were not statistically significant (respectively, 52 (%14.6) vs 66 (%18.5), p=0.426 and 30 (%25.6) vs 23 (%19.7), p=0.295). The comparison of parameters between genders is presented in Table 2.

DISCUSSION

Currently, anemia is reported to be the leading medical problem in the elderly population and it is considered a risk factor for a series of unfavorable conditions in old adults, such as hospitalization, low bone density, falls and fractures, and morbidity and mortality (9). After the age of 50 years, the prevalence of anemia increases in correlation with age and surpasses 20% in patients older than 85 years (10). In the present study, the prevalence of anemia in the ≥81 year's age group was higher compared with the younger age groups.

As a natural consequence of the aging of societies, the prevalence of anemia is expected to rise rapidly, and this is considered to be a risk factor that will increase mortality in the elderly population (11,12). As in all age groups, the etiological distribution of anemia is variable in the elderly patient group (13). In general, 1/3 of anemia encountered in the elderly population is nutritional anemia (iron, B12, folate), 1/3 is anemia of chronic disease, and 1/3 is linked to other causes or unexplained anemia (8). However, these groups are not absolutely discrete. For example, one patient may present multiple causes, each of which may independently cause anemia.

The causes of anemia in hospitalized elderly patients can be listed as: chronic disorders (35%), unexplained (17%), iron deficiency (15%), bleeding (7%), kidney failure, liver and endocrine diseases (6.5%), myelodysplasia or acute leukemia (5.5%), chronic leukemia or lymphoma (5.5%), vitamin B12 or folic acid deficiency (5.5%), and other hematologic disorders (3%) (14,15). The causes of anemia in elderly patients who had outpatient follow–up can be listed as: chronic disorders (17%), unexplained (36%), iron deficiency (8%), kidney and liver failure and endocrine diseases (8%), other hematologic disorders (8%) and infections (23%). The present study could not evaluate the patients in this regard as data concerning the etiologic distribution were not fully available and these parameters could not be examined. However, we can state based on our observations that the most common cause of anemia among consulted inpatients is anemia of chronic disease, and the most common cause among outpatients is nutritional anemia.

Hemoglobin levels decrease with aging, and consequently, the condition of anemia is becoming a more significant health problem in the elderly population. The prevalence of anemia varies greatly across different studies. For example, the National Health and Nutrition Examination Survey III (NHANES III) conducted in the USA determined the prevalence of anemia as 11.0% in males and 10.2% in females older than 65 years (17), while Olivares et al. found prevalence rates of 5.4% in males and 4.4% in females in a study that included 274 patients older than 60 years (18). Again, the prevalence of anemia was determined as 6.1% in males and as 10.5% in females in a study conducted by Fleming et al. on 1016 patients aged between 67–96 years. In the present study, the prevalence of anemia was determined as 24.8% in males and 32.4% in females and exceeds the rates reported in the literature. We reason that this is linked to variables that can influence the prevalence of anemia, such as the heterogeneity of the selected groups, differences in race and ethnic structure, living conditions, and health conditions.

NHANES III data also demonstrated that anemia varies depending on age, gender, and racial and ethnic categories. The ages during which the prevalence of anemia is the lowest are 17–49 in males, and reproductive ages in females, followed by the ages 50–64 (18). In general, prevalence increases in correlation with aging after the age of 64, both in males and males (19,20).

CONCLUSION

The prevalence of anemia across all of our ≥60 year's patient groups was determined as 28.5%. The prevalence of anemia was higher in males, both when evaluated across the entire patient group and when the female and male populations were evaluated separately. With respect to morphological prevalence, normocytic anemia was the most prevalent and macrocytic anemia was the least prevalent. Anemia was more prevalent among males than females between ages 60–70 years. Its prevalence was equal between genders between ages 71–80 years. Meanwhile, its prevalence rate was 10% higher in females than males in patients older than 80 years. In daily practice, determining the prevalence of anemia in

the elderly patient group and, if possible, its distribution according to etiologic factors, may provide practical knowledge regarding the approach to be adopted towards patients in a certain region. In our study, the prevalence of anemia in patients aged 60 or older and the distribution of anemia based on morphological classification were determined. The major limitation of this study is that etiologic distribution could not be revealed. However, we think that our study still provides important insight and awareness regarding the elderly anemic patient population in our region. It will contribute to the studies that will be conducted in the same region.

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