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Original Article

Prevalence and Patterns of Anemia Among Patients With Heart Failure in Mogadishu, Somalia: A Retrospective Study

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ABSTRACT

Background: Anemia is considered an independent predictor of death in patients with heart failure (HF). The main objective of this study was to determine the prevalence and patterns of anemia among patients with HF in Mogadishu, Somalia.

Methods: This is a retrospective assessment of patients with HF admitted to the cardiology outpatient and emergency departments of Mogadishu Somali Turkish Training and Research Hospital between January 2021 and March 2021.

Results: The study population consisted of 200 patients at a mean age of 62.26 years (SD= ±14 y). Male was the predominant sex with 114 patients (57%). Fifty-nine patients (29.5%) had anemia. Iron-deficiency anemia was reported in 37 patients (18.5%), vitamin B12 deficiency anemia in 9 (4.5%), anemia of chronic disease in 9 (4.5%), folic acid deficiency anemia in 2 (1%), both iron deficiency and folic acid deficiency in 1 (0.5%), and a combination of iron, folic acid, and B12 deficiency in 1 (0.5%). The majority of the studied patients (n=141, 70.5%) were non-anemic. No association existed between anemia and age, sex, and HF type (P<0.776, P<0.605, and P<0.553, respectively).

Conclusions: The prevalence rate of anemia among patients with HF in Mogadishu was 29.5%. Anemia was more prevalent in the older population, and iron-deficiency anemia was the most common type of anemia. ***(Iranian Heart Journal 2022; 23(2): 61-67)***

KEYWORDS: Anemia, Heart failure, Prevalence, Somalia, East Africa

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Anemia by definition is decreased circulating red blood cells or hemoglobin in the blood, or when red blood cells become too ineffective to carry oxygen to the organs.[1,2] The World Health Organization (WHO) described anemia as a condition when the hemoglobin level is below 13 mg/dL and 12 mg/dL in men and women, respectively.[3]

Anemia can be due to a lack of red blood cell production, increased red blood cell destruction, and bleeding.[4] It is a common clinical finding in patients suffering from heart failure (HF), with its prevalence

ranging between 30% and 70% of patients regardless of their ejection fraction (EF).[5,3] Some studies have suggested that anemia in HF can be due to multiple factors.[6]

Iron deficiency is a subtype of anemia that is more common in patients with HF and can influence the outcome of HF negatively.[7] The European Society of Cardiology (ESC) recommends screening of iron-deficiency anemia for any patient who has symptomatic HF.[8] Anemia is also considered an independent predictor of death in patients with HF.[9]

Despite its significance, this particular subject has yet to be investigated in Somalia. The main objective of the present study was to determine the prevalence and patterns of anemia among patients with HF in Mogadishu, Somalia.

METHODS

Study Design, Setting, and Population

The current investigation is a retrospective assessment of patients with HF admitted to the cardiology outpatient and emergency departments of Mogadishu Somali Turkish Training and Research Hospital between January 2021 and March 2021.

Mogadishu Somali Turkish Training and Research Hospital is a tertiary hospital in Mogadishu, Somalia. The hospital is the main healthcare provider in southern Somalia.[10]

Data were obtained from the Mogadishu Somali Turkish Training and Research Hospital database system using date and ICD-10 codes. Totally, 200 patients with HF regardless of their age and sex who had no missing data were selected for this study. Age, sex, the cause of HF, and the type of HF were among the examined variables. The hemoglobin level, the hematocrit, mean corpuscular volume, mean corpuscular hemoglobin, the iron level, total iron-binding capacity, transferrin saturation, the ferritin level, the folic acid level, and the level of vitamin B12 were also examined.

A hemoglobin level of less than 13 g/dL in men and 12 g/dL in women with HF was considered to be anemia. HF with an EF of less than 40% was considered HF with reduced ejection fraction, HF with an EF between 40% and 50% was considered HF with mid-range EF, and HF with an EF of more than 50% was considered HF with preserved EF.

Patients younger than 18 years, patients with missing data in the system, and patients who refused to participate were excluded from this study.

Informed consent was obtained from the patients. No personal data were revealed in this study. The study protocol was evaluated and approved by the Ethics Committee of Mogadishu Somali Turkish Training and Research Hospital.

Statistical Analysis

Data were collected using Microsoft Excel and analyzed using the Statistical Package for Social Sciences (SPSS) software, version 26. Descriptive data analysis and the Pearson correlation were used in this study. A *P* value of less than 0.05 was considered significant.

RESULTS

With respect to age, the mean age of the study population, consisting of 200 patients with HF, was 62.26 years (SD= ±14 y). The minimum age was 20 years, and the maximum age was 92 years (Table 1). The age group of 61 to 80 years was the predominant age group (n=92, 46%), followed by the age group of 41 to 60 years (n=74, 37%), the age group of 26 to 40 years (n=16, 8%), the age group of more than 80 years (n=16, 8%), and the age group of 18 to 25 years (n=2, 1%) (Table 2).

Apropos of sex, 114 patients (57%) were male and 86 (43%) were female (Table 1).

Concerning the type of HF, the most prominent type was HF with preserved EF (n=95, 47.5%), followed by HF with reduced EF (n=68, 34%), and HF with mid-range EF (n=37, 18.5%) (Table 2).

As regards the cause of HF, the most common cause of HF was hypertension (n=99, 49.5%), followed by ischemic heart disease (n=56, 28%), valvular heart disease (n=34, 17%), and cardiomyopathy (n=11, 5.5%) (Fig. 1).

Concerning the prevalence of anemia, 59 patients (29.5%) had anemia. Additionally, among the 200 patients with HF, who comprised the study population, 37 patients (18.5%) had iron-deficiency anemia, 9 (4.5%) had vitamin B12 deficiency anemia, 9 (4.5%) had anemia of chronic disease, and 2 (1%) had folic acid deficiency anemia. Furthermore, a combination of iron and folic acid deficiency was reported in 1 patient (0.5%) and a combination of iron, folic acid, and vitamin B12 deficiency was observed in 1 patient (0.5%). The majority of the studied patients (n=141, 70.5%) were non-anemic.

The 59 patients with anemia were composed of 34 men (58%) and 25 women (42%). Anemia was also predominant in the age group of 61 to 80 years (n=22, 37%), followed by the age group of 41 to 60 years (n=21, 36%), the age group of more than 80 years (n=8, 13%), the age group of 26 to 40 years (n=7, 12%), and the age group of 18 to 25 years (n=1, 2%). Iron-deficiency anemia was more common in patients suffering from HF with preserved EF (n=18, 49%) than in those suffering from HF with reduced EF (n=13, 35%) and those suffering from HF with mid-range EF (n=6, 16%) (Table 2).

No association was found between anemia and age (P<0.776), sex (P<0.605), and the type of HF (P<0.553).

Table 1: Age and sex distribution among the studied patients

Age		
Mean		62.26
Median		62.00
Std. Deviation		14.034
Minimum		20
Maximum		92
Sex		
	Frequency	Percentage
Male	114	57%
Female	86	43%
Total	200	100%

Table 2: Prevalence of anemia in terms of demographic variables

Age	Non-anemic	Iron-Deficiency Anemia	Vb12 Deficiency	Folic Acid Deficiency	Anemia of Chronic Disease	Iron and Folic Acid Deficiency	Iron, Vb12, and Folic Acid Deficiency	*P* value
18-25	1 (0.7%)	0 (0%)	0 (0%)	0 (0%)	1 (11.1%)	0 (0%)	0 (0%)	
26-40	9 (6.4%)	4 (11%)	0 (0%)	0 (0%)	3 (33.3%)	0 (0%)	0 (0%)	
41-60	53 (37.6%)	13 (35%)	3 (33%)	1 (50%)	3 (33.3%)	0 (0%)	1 (100%)	<.776
61-80	70 (49.6%)	14 (38%)	4 (45%)	1 (50%)	2 (22.2%)	1 (100%)	0 (0%)	
>80	8 (5.7%)	6 (16%)	2 (22%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	
Sex								
Female	61 (43%)	15 (41%)	4 (44%)	1 (50%)	3 (33%)	1 (100%)	1 (100%)	<.605
Male	80 (57%)	22 (59%)	5 (56%)	1 (50%)	6 (67%)	0 (0%)	0 (0%)	

Type of HF								
HF with preserved EF	65 (46%)	18 (49%)	6 (67%)	0 (0%)	4 (44.1%)	1 (100%)	1 (100%)	<.553
HF with mid-range EF	29 (21%)	6 (16%)	1 (11%)	0 (0%)	1 (11.1%)	0 (0%)	0 (0%)	
HF with reduced ejection fraction	47 (33%)	13 (35%)	2 (22%)	2 (100%)	4 (44.4%)	0 (0%)	0 (0%)	
Total								
	141 (70.5%)	37 (18.5%)	9 (4.5%)	2 (1%)	9 (4.5%)	1 (0.5%)	1 (0.5%)	

Vb12, Vitamin B12; HF, Heart failure; EF, Ejection fraction

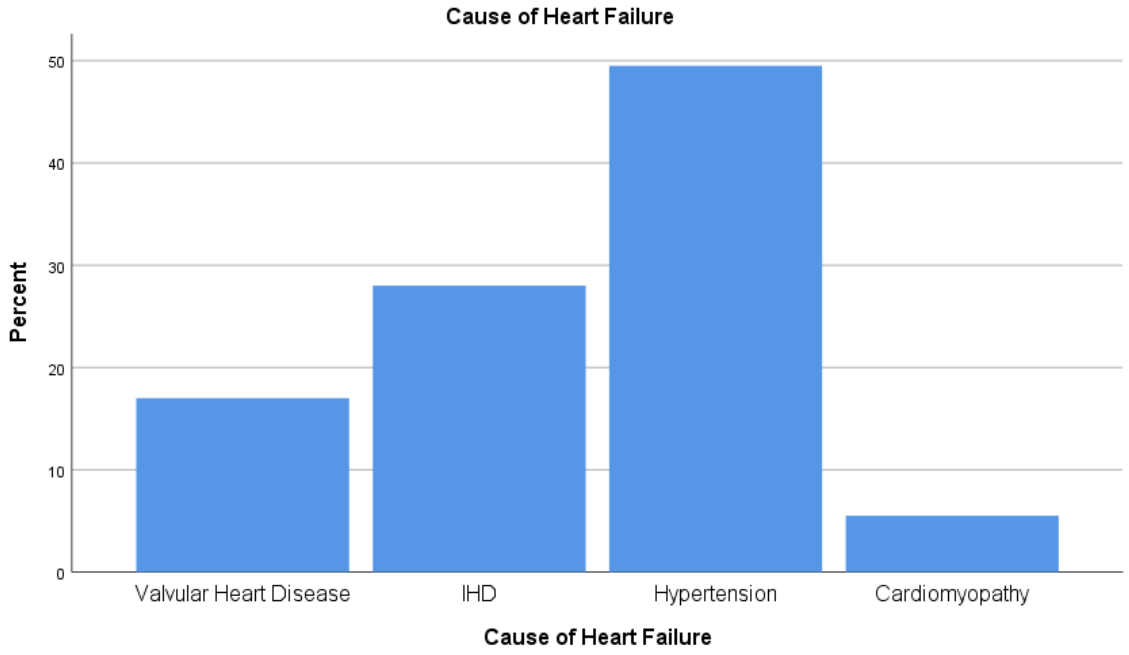

Figure 1: The figure shows the causes of heart failure among the studied patients.
IHD, Ischemic heart disease

DISCUSSION

HF is a major global health burden with an estimated 38 million patients worldwide.[11] Hospitalization among patients with HF is very high with 83% being hospitalized at least once and 43% at least 3 to 4 times.[12] HF is more common in the older population,[13] and its prognosis is thought to be worse than that of most cancers.[11]

Anemia is common in patients with HF. It undermines their quality of life and is considered a significant morbidity among them.[14,15] Despite the well-known negative effects of anemia on HF,[9] the present study is the first investigation to determine the epidemiology of anemia among patients with HF in Somalia.

In our study, we found that the prevalence rate of anemia among patients with HF in

Mogadishu, Somalia, was 29.5%. In addition, we found that anemia was more common (37%) in the age group of 61 to 80 years. The results also showed that iron-deficiency anemia was the most common type of anemia (18.5%) in our patients with HF.

Lawrence et al[16] in 2016 concluded that anemia, especially iron-deficiency anemia, was highly prevalent in patients with congestive HF. Similarly, a study done by Cavalini et al[17] in 2016 in Brazil found that anemia was more common among patients with HF, especially in the older population (>60 y). This conclusion agrees with ours that anemia is more prevalent in older people with HF.

Furthermore, in 2016, Cleland et al[18] found that the prevalence rate of anemia in patients suffering from HF with or without left ventricular systolic dysfunction was 33.3%, which is slightly higher than what we found in our study.

In 2017, Son et al[19] in South Korea found a higher prevalence rate of anemia among patients with HF visiting a tertiary care center than what we observed in the present study (39.1% vs 29.5%).

Chobufo et al[20] in 2018 reported that 1 in 2 patients had iron-deficiency anemia among their study population.

There are limitations to the current study. Firstly, it is only a single-center study. Therefore, a nationwide study including multiple centers is needed to determine the prevalence of anemia among patients with HF across Somalia. Secondly, the study design was retrospective with a relatively small number of patients.

CONCLUSIONS

The prevalence rate of anemia among patients with HF in our study was 29.5%. Iron-deficiency anemia was the most common type of anemia among this population. Early screening, follow-up, and treatment of anemia in patients with HF can reduce the number of anemic patients in this population, thus minimizing the burden of anemia in patients with HF.

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Data Availability

The data are available from the corresponding author and can be accessed upon request.

Conflict of Interest

The authors declare that they have no competing interests.

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The authors declare that they have no funding source for this research.

Authors' Contributions

Mohamed OOJ, performed data collection, data analysis, and prepared the manuscript.

Rukia OBA participated in the data entry and data analysis.

All the authors have read and approved the manuscript before submitting it.

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