ORIGINAL RESEARCH

A study of anemia in hospitalized patients of heart failure with reduced ejection

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ABSTRACT
Background: The present study was conducted for evaluation of anemia in hospitalized patients of hospitalized patients of heart failure with reduced ejection.
Materials & methods: A total of 50 patients with presence of heart failure with reduced ejection fraction were enrolled. Complete demographic details of all the patients were recorded. Heart failure was diagnosed based on history, signs and symptoms, clinical parameters, laboratory parameters and 2D ECHO used to measure ejection fraction. Complete blood count, serum iron, serum ferritin, TSAT, vitamin B12 were done along with other laboratory parameters. Anemic patients were evaluated separately for different demographic details.
Results: Overall relance of anaemia among heart failure patients with reduced ejection fraction was 58 percent. 65.52 percent of the patients with anaemia and 57.14 percent of the patients without anaemia were males while the remaining were females. Mean age of the patients with and without anaemia was 58.3 years and 59.4 years respectively. Cough, palpitation, exertional dyspnea, chest pain and fatigue were seen in 51.72 percent, 48.28 percent, 100 percent, 62.06 percent and 82.76 percent of the patients respectively.
Conclusion: From the above results, the authors concluded that significant proportion of heart failure patients with reduced ejection fraction are affected with anaemia with non-specific clinical profile.
Key words: Anaemia, Heat failure, Ejection

INTRODUCTION
Heart failure (HF) is a complex clinical syndrome that results from either functional or structural impairment of ventricles resulting in symptomatic left ventricle (LV) dysfunction. The symptoms come from an inadequate cardiac output, failing to keep up with the metabolic demands of the body. It is a leading cause of cardiovascular morbidity and mortality worldwide despite the advances in therapies and prevention. It can result from disorders of the pericardium, myocardium, endocardium, heart valves, great vessels, or some metabolic abnormalities.[1-3]
Comorbidities are crucial factors affecting prognosis of HF. A number of diseases have been shown to increase morbidity and mortality in patients with HF. Among these comorbidities,

anemia has been shown to increase mortality and hospitalization, impair health-related quality of life, and reduce exercise capacity among patients with HF. Hypoxic condition due to anemia requires hemodynamic compensation involving a vasodilation-mediated high-output state with neurohormonal activation and ultimately leads to worsening prognosis of HF.[4-6]Hence; the present study was conducted for evaluation of anemia in hospitalized patients of hospitalized patients of heart failure with reduced ejection.

MATERIALS &METHODS

The present study was conducted for evaluation of anemia in hospitalized patients of hospitalized patients of heart failure with reduced ejection. A total of 50 patients with presence of heart failure with reduced ejection fraction were enrolled. Complete demographic details of all the patients were recorded. Heart failure was diagnosed based on history, signs and symptoms, clinical parameters, laboratory parameters and 2D ECHO used to measure ejection fraction. Complete blood count, serum iron, serum ferritin, TSAT, vitamin B12 were done along with other laboratory parameters. Anemic patients were evaluated separately for different demographic details. All the results were recorded and analyzed using SPSS software.

RESULTS

In the present study, a total of 50 patients were analyzed. Among these heart failure patients, anaemia was present in 29 patients. Hence; overall relance of anaemia among heart failure patients with reduced ejection fraction was 58 percent. 65.52 percent of the patients with anaemia and 57.14 percent of the patients without anaemia were males while the remaining were females. Mean age of the patients with and without anaemia was 58.3 years and 59.4 years respectively. Cough, palpitation, exertional dyspnea, chest pain and fatigue were seen in 51.72 percent, 48.28 percent, 100 percent, 62.06 percent and 82.76 percent of the patients respectively. Non-significant results were obtained while comparing the distribution of patients according to NYHA class among anemic and non-anemic patients.

Table 1: Prevalence of anaemia

Anaemia	Number	Percentage
Present	29	58
Absent	21	42
Total	50	100

Table 2: Demographic data

Variable	Anaemia				p- value
	Present (n=29)		Absent (n=21)		
	Number	Percentage	Number	Percentage	
Mean age (years)	58.3		59.4		0.12
Males	19	65.52	12	57.14	0.84
Females	10	34.48	9	42.86	

Table 3: Clinical profile

Variable	Anaemia				p- value
	Present (n=29)		Absent (n=21)		
	Number	Percentage	Number	Percentage	
Cough	15	51.72	12	57.14	0.11
Palpitation	14	48.28	11	52.38	0.34
Exertional dyspnea	29	100	21	100	0.27

Chest pain	18	62.06	15	71.42	0.46
Fatigue	24	82.76	17	80.95	0.59

Table 4: NYHA Class

NYHA Class	Anaemia				p- value
	Present (n=29)		Absent (n=21)		
	Number	Percentage	Number	Percentage	
Class I	0	0	1	4.75	0.412
Class II	6	20.68	4	19.05	
Class III	12	41.38	8	38.10	
Class IV	11	37.94	8	38.10	
Total	29	100	21	100	

DISCUSSION

Heart failure is a clinical syndrome characterized by dyspnea or exertional limitation due to impairment of ventricular filling or ejection of blood or both. HFrEF occurs when the left ventricular ejection fraction (LVEF) is 40% or less and is accompanied by progressive left ventricular dilatation and adverse cardiac remodeling. Assessment for heart failure begins with obtaining a medical history and physical examination. Also central to diagnosis are elevated natriuretic peptides above age- and context-specific thresholds and identification of left ventricular systolic dysfunction with LVEF of 40% or less as measured by echocardiography.

The symptoms of heart failure can be associated with other conditions and include dyspnoea, fatigue, limitations in exercise tolerance and fluid accumulation, which can make diagnosis difficult. Management strategies include the use of pharmacological therapies and implantable devices to regulate cardiac function. Despite these available treatments, heart failure remains incurable, and patients have a poor prognosis and high mortality rate.[6-8]

In retrospect, anemia, accompanying HF, has an overall adverse impact on the prognostic outcome of patients. Nagatomo et al reported that anemia leads to an elevated hyper-hemodynamic in patients with HF. Moreover, increased cardiac workload by the means of stroke volume could also influence the sympathetic nervous activity which eventually can contribute to cardiac remodeling especially in the left ventricle, eventually promoting morbidity and mortality in HF patients.[9-11] Hence; the present study was conducted for evaluation of anemia in hospitalized patients of hospitalized patients of heart failure with reduced ejection.

In the present study, a total of 50 patients were analyzed. Among these heart failure patients, anaemia was present in 29 patients. Hence; overall relance of anaemia among heart failure patients with reduced ejection fraction was 58 percent. 65.52 percent of the patients with anaemia and 57.14 percent of the patients without anaemia were males while the remaining were females. Our results were in concordance with the results obtained by Xia H et al who also reported similar findings. In their study, authors evaluated the prognostic impact of anemia on mortality and hospitalization outcomes in patients with HF. Out of 1,397 studies, 11 eligible studies were included with a total of 53,502 HF patients. Among them, 19,794 patients suffered from anemia, and 33,708 patients did not have anemia. A meta-analysis revealed a high-odds ratio (OR) for the overall mortality in patients with anemia. A high-risk ratio was also reported for hospitalization as the outcome in patients with anemia. Their systematic review and meta-analysis provide evidence of the high risk of mortality and hospitalization-related outcomes in patients with HF and anemia.[12] The prevalence of anemia in patients with HF (defined as hemoglobin <13 g/dL in men and <12 g/dL in women)6 is ≈30% in stable and ≈50% in hospitalized patients, regardless of whether patients have HFrEF

or HF with preserved ejection fraction, compared with <10% in the general population (although prevalence increases with age, exceeding 20% in subjects ≥85 years old).[13-15]

Mean age of the patients with and without anaemia was 58.3 years and 59.4 years respectively. Cough, palpitation, exertional dyspnea, chest pain and fatigue were seen in 51.72 percent, 48.28 percent, 100 percent, 62.06 percent and 82.76 percent of the patients respectively. Non-significant results were obtained while comparing the distribution of patients according to NYHA class among anemic and non-anemic patients. In a similar study conducted by Abebe TB et al, authors evaluated the prevalence of anemia in patients with HF. The prevalence of anemia in the study cohorts was 41.90% and majority of the participants were females (64.59%). There was a significant difference in the level of hemoglobin, creatinine, and sodium among anemic and non-anemic patients. Anemic patients with HF tend to take angiotensin converting enzyme inhibitors (ACEI) less frequently. Kaplan Meier survival curves and Log rank test (P = 0.042) showed a significant difference in the prognosis of HF patients with anemia and non − anemic. More significant difference was observed (Log rank test, P = 0.001) in the study participants based on hemoglobin level.[16]

CONCLUSION

From the above results, the authors concluded that significant proportion of heart failure patients with reduced ejection fraction are affected with anaemia with non-specific clinical profile.

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