Pak Heart J

FREQUENCY OF ANEMIA AND CLINICAL OUTCOME IN PATIENTS WITH CONGESTIVE HEART FAILURE

Malik Faisal Iftekhar[1], Abdul Sami[2],Imran Khan[3], Akhter Sher[4]

[1-4]Hayatabad Medical Complex, Hayatabad, Peshawar - Pakistan

Address for Correspondence:

Malik Faisal Iftekhar
Department of Cardiology,
Hayatabad Medical Complex,
Hayatabad, Peshawar - Pakistan

Emails: malikfaisal6@gmail.com

Date Received: October 14,2017
Date Revised: November 21,2017
Date Accepted: December 19,2017

Contribution

MFI & AS conceived the idea, planned the study and drafted the manuscript. IK & AS collected data, did statical analysis and critically reviewed manuscript. All authors contributed significantly to the submitted manuscript.

All authors declare no conflict of interest.

This article may be cited as: Iftekhar MF, Sami A, Khan I, Sher A. Frequency of anemia and clinical outcome in patients with congestive heart failure. Pak Heart J 2018; 51 (01): 77-81.

ABSTRACT

Objective: To determine the frequency of anemia and its short term clinical outcome among patients with congestive heart failure.

Methodology: This cross sectional study was conducted at Cardiology Department Lady Reading Hospital Peshawar. The study duration was six months from January 2014 to January 2016. Patients of either gender with age more than 14 years presenting with congestive heart failure were included in the study. Sample size was calculated using WHO sample calculator. Non probability consecutive sampling technique was used for sample collection.

Results: A total of 159 patients were included in the study, mean age was 68±1.28 years. About 57% patients were males. Our study showed that the frequency of anemia was 46(29%) in patients presenting with congestive heart failure of them, in hospital mortality was 7%, and 81 % patients were re hospitalized.

Conclusion: Anemia in congestive heart failure acts as a bad prognostic factor resulting in increased rate of mortality and re hospitalization.

Key Words: Anemia, Short term clinical outcome, Congestive heart failure.

INTRODUCTION

Cardiovascular disease has a major impact on global health. According to the World Health Organization, an estimated 17.1 million people died of cardiovascular diseases worldwide in 2004, representing 29% of all deaths; approximately 23.6 million people are expected to die from these diseases in 2030.Congestive Heart failure (HF) is a complex syndrome, resulting from impaired ability of heart to pump, to support a physiological circulation. Congestive heart failure affects about 2% of the western population, with prevalence increasing sharply from 1% in 40 years olds to 10% above age 75 and it is the most common cause of hospitalization in patients over 65 years of age.

Patients with chronic heart failure (CHF) suffer from a marked impairment of health-related quality of life (HRQoL) compared with the normal population and patients with other chronic conditions. Among the factors associated with a reduced HRQoL, dyspnea and fatigue are major symptoms of CHF that persist in many patients despite optimal drug and device management.

Anemia is a common co-morbidity in older adults with heart failure and a preserved ejection fraction (HFPEF) and is associated with worse outcomes. Anemia accompanies chronic heart failure (CHF) in up to 55% of patients. Although the reports of prevalence of anemia vary widely, it is unequivocal that anemia is prevalent in patients with heart failure regardless of the clinical setting. The prevalence of anemia was reported to be 37.2% in a recent meta-analysis of a total of 153,180 patients with heart failure across 34 published studies over a seven-year period (2001–2007). In CHF patients, even mild anemia is associated with worsening of symptoms, increased New York Heart Association (NYHA) class, and impaired functional capacity, quality of life, and survival.[7]

The mechanisms underlying anemia in CHF patients are multi-factorial it can be due toabsolute or relative iron and/or erythropoietin deficiency due to chronic inflammation or chronic renal failure is present. Iron plays a vital role in energy-dependent physiological processes such as erythropoiesis and oxidative phosphorylation, and iron deficiency (ID) may be a frequent and significant comorbidity in CHF. Beyond anemia, ID is a determinant of fatigue and impaired exercise capacity in otherwise healthy populations.[5] Nanas et al. found that 73% of patients with advanced heart failure and anemia had depleted iron stores on bone marrow aspiration and Iron deficiency anemia is associated with decreased survival in CHF patients.[11,12] A systematic review of >150 000 patients has shown that patients with CHF and anemia have an increased risk for death; 48% of anemic patients died within 6 months from the time of diagnosis of CHF compared with 29.5% of non-anemic patients.[9]

The present study is designed to determine the frequency of anemia and its three months clinical outcome after treatment in patients with CHF. CHF is not uncommon in our population and carries immense degree of burden on hospital and patient resources due to repeated admissions and chronicity of the illness. Anemia is a frequent association of CHF and carries bad prognosis if left undiagnosed and untreated. This study will provide us with a local data about the frequency and clinical outcome of anemia in patients with CHF. The results of this study will be shared with other locally available cardiologists and physicians and future recommendations may be decided either for conducting more research or practice modifications.

METHODOLOGY

This cross sectional study was conducted in Cardiology Unit, Lady Reading Hospital Peshawar from January 2014 to 2015. Sample size was calculated; using 11.7% of mortality rate in anemic patients with CHF, calculated with WHO sample size calculator, with 95% confidence interval and 5% margin of error. Non-probability consecutive sampling technique was used. Patients of either gender aged 14 years and above with congestive heart failure of $\geqslant$ 6 months duration, presenting to Cardiology Unit, Lady Reading Hospital Peshawar were included.

Patients with chronic obstructive pulmonary disease diagnosed by history and FEV_1 of less than 70%, chronic renal failure on dialysis. Chronic liver disease diagnosed by history and medical records, history of intake of any type of multivitamin or iron therapy in the last three months and history of blood transfusions in the last three months or bleeding of any amount in the last three months were exclude from the study.

The study was conducted after approval from hospitals ethical and research committee. All patients of congestive heart failure were included in the study through OPD A&E department ward. The purpose and benefits of the study was explained to all patients and a written informed consent was obtained.

All patients were subjected to detailed history and clinical examination, followed by complete routine clinical examination. Baseline investigations were done which were included complete blood picture to detect anemia. The treatment of anemia was decided in collaboration of physician. All the patients were started on standard treatment of CHF as per hospital protocol and were followed for 7 days to detect in hospital death. All the patients were discharged on standard treatment of CHF if indicated and were followed through telephone or visit in person for 3 months to detect mortality and re admission.

All the above mentioned information including name, age and gender Hemoglobin (Hb) level, re admission and death

was recorded in a pre-designed proforma.

The collected data was stored and analyzed in SPSS version 16 for windows. Mean ± SD was calculated for numerical variables like age, gender, Hb level and duration of CHF at presentation. Frequencies and percentages was calculated for categorical variables like gender, anemia and three months clinical outcomes (in hospital mortality, 3 months mortality re admissions). Anemia and three months clinical outcome was stratified among age and gender and duration of CHF to see the effect modifications. All results were presented in the form of tables and graphs.

RESULTS

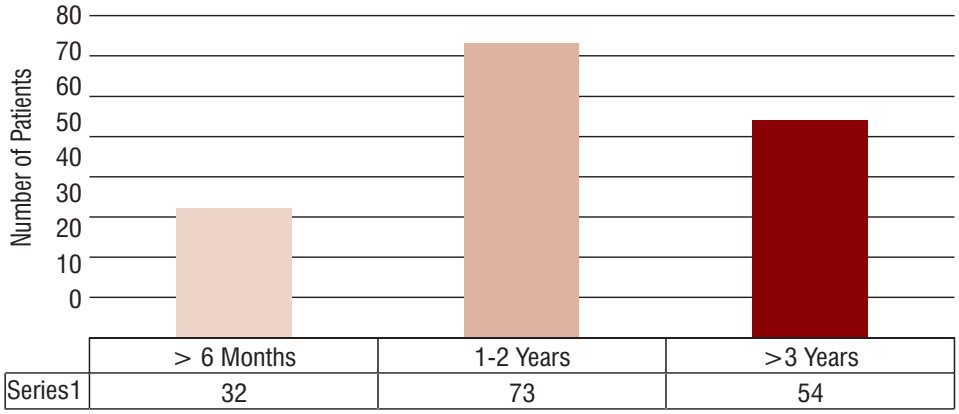
This study was conducted at Cardiology Department, Lady Reading Hospital, Peshawar in which 159 patients were observed for the frequency of anemia and clinical outcome and the results were analyzed. About 91(57%) patients were male, 29(18%) patients were in age range 20-40 years, 66(42%) patients were in age range 41-60 years, 48(30%) patients were in age range 61-80 years, and 16 (10%) patients were in age range more than 80 years. Mean age was 68 ±1.2 years.

Of them 32(20%) patients had CHF for more than 6 months, 73(46%) patients had CHF for 1-2 years, 54(34%) patients had CHF for >3 years. Mean duration was 1± 2.77 years (Figure 1).

About 46(29%) patients had Hb Level <11 gm/dl while 113(71%) patients had Hb level more than 11 gm/dl. Mean Hb was 12±1.91 gm/dl (Figure 2).

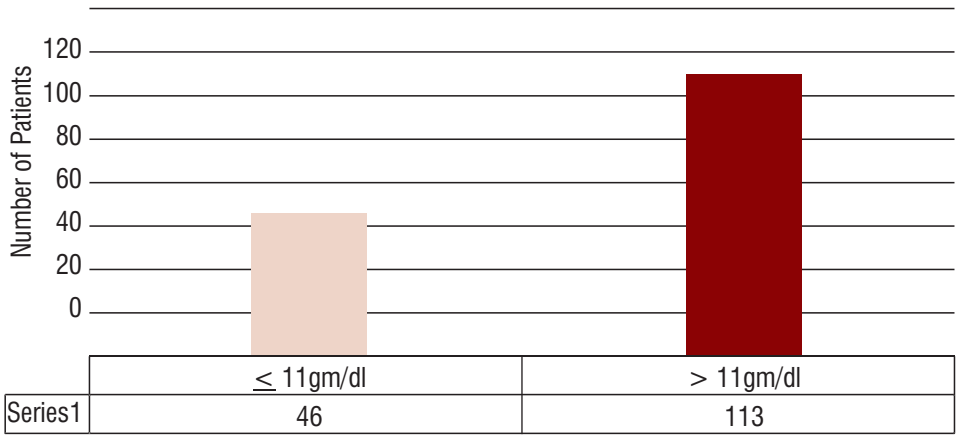
Clinical outcome among 46 anemic patients was analyzed as 3(7%) patients died in hospital, 37(81%) patients were re hospitalized while 6 (12%) patients died at 3 months follow up. Stratification of clinical outcome with age, gender and duration of CHF is given in Table 1.

Figure 1: Duration of Congestive Heart Failure (n=159)



Mean duration was 1 years with SD ±2.77

Figure 2: Serum Hemoglobin Level in Patients (n=159)



Mean Hb was 12 gm/dl with SD ±1.91

Table 1: Stratification of Clinical Outcome in Study Population (n=46)

Variable	Hospital Mortality	Re-hospitalized	Mortality
Gender			
Male	02	21	03
Female	01	16	03
			p-value = 0.003
Age distribution:			
20-40 years	00	10	0
41- 60 years	01	14	03
61-80 years	01	12	01
>80 years	03	02	01
			p-value = 0.002
Distribution of CHF			
>6 months	00	06	01
1-2 years	01	20	11
>3 years	01	03	02
			p- value = 0.003

DISCUSSION

There is ample evidence that suggests anemia is an independent risk factor for worse outcomes in patients with heart failure (CHF) and ischemia heart disease including myocardial infarction, and anemia is a common co-morbidity in CHF. Non-anemic patients compared with anemic patients are associated with worse cardiac clinical status, more severe systolic and diastolic dysfunction, a higher beta natriuretic peptide level, rapidly decreasing kidney functions, low physical activity and high dependence, and increased financial burden.

In a systematic review and meta-analysis published in 2008, after a minimal follow-up of 6 months, 46.8% of anemic patients died compared with 29.5% of non-anemic patients irrespective to the cause of CHF. A decrease in 1-g/dL in hemoglobin was independently associated with significantly increased mortality risk.

Our study shows that mean age was 68 years with SD ±1.28. Fifty seven percent patients were male and 43% patients were female. More over the frequency of anemia was 46(29%) in patients presenting with congestive heart failure in which 7% patients had in hospital mortality, 81% patients were re hospitalized while 6 (12%) patients died during 3 months period.

In CHARM Program in the United States and Canada 2653 pateints were randomized and associations between hemoglobin and outcomes were studies. Anemia was more common in heart failure regardless to impaired LV systolic functions.Low levels of hemoglobin was associated with higher LVEF yet was an independent predictor of adverse mortality and morbidity outcomes.

Anemia in CHF mainly is caused by a combination of renal failure and CHF-induced increased cytokine production resulting in the reduction of erythropoietin (EPO) production, bone marrow resistance to EPO stimulation, reduced intestinal absorption of iron and reduced release of iron from iron stores which is cytokine-induced causes iron deficiency anemia. The use of ACE/ARBs may inhibit the bone marrow response to EPO.In CHF there is hemodilution that causes low hemoglobin level.

Pilot studies have found that in a large number of HF patients it's safe to raise hemoglobin with erythropoietin-stimulating therapies and there is a suggestion that raising hemoglobin in anemic HF patients may lead to improved outcomes. Studies have shown that in anemic patients with reduced ejection fraction of 40% or less, when treated , have shown improvement in NYHA, less dependence of intravenous diuretics, reduced length of stay at the hospital, and improvement in renal functions were all significantly greater in the control group than in the treated group.

The Study of Anemia in Heart Failure Trial (STAMINA-HeFT) is a large multicenter, randomized, double-blind, placebo-controlled trial, demonstrated that even with increase of only 1.0 g/dL or more in hemoglobin resulted in reduction of all-cause mortality or heart failure-related hospitalization. A pragmatic approach to the care of patients with HF needs definitive anemia treatment goals that are dynamic and disease specific, rather than those that adopt a more simplistic hemoglobin-specific approach.

CONCLUSION

Our study results are very much similar to international studies in anemia prevalence in CHF patients . Therefore it should be considered as bad prognostic factor and should be treated vigorously so as to decrease morbidity and mortality.

REFERENCES

1. US Food and Drug Administration. FDA approves first implantable wireless device with remote monitoring to measure pulmonary artery pressure in certain heart failure patients (news release). Available at. Accessed June 2, 2016.
2. O'Riordan M. FDA approves first implantable device for remotely monitoring HF patients. Heartwire [serial online]. May 28, 2014;Accessed June 2, 2016.
3. Framingham Classification: Ho KK, Pinsky JL, Kannel WB, Levy D. The epidemiology of heart failure: the Framingham Study. J Am Coll Cardiol. Oct 1993;22(4 Suppl A):6A-13A.
4. American Heart Association. Classes of heart failure.. Accessed September 6, 2016.
5. Hunt SA, for the Task Force on Practice Guidelines (Writing Committee to Update the 2001 Guidelines for the Evaluation and Management of Heart Failure). ACC/AHA 2005 guidelineupdate for the diagnosis and management of chronic heart failure in the adult: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *J Am Coll Cardiol*. 2005;46(6):51-82.
6. Dickstein K, Cohen-Solal A, Filippatos G, et al. for the Task Force for the Diagnosis and Treatment of Acute and Chronic Heart Failure 2008 of the European Society of Cardiology. ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure 2008: the Task Force for the Diagnosis and Treatment of Acute and Chronic Heart Failure 2008 of the European Society of Cardiology. Developed in collaboration with the Heart Failure Association of the ESC (HFA) and endorsed by the European Society of Intensive Care Medicine (ESICM). Eur Heart J.2008;29(19):2388-442.
7. Lindenfeld J, Albert NM, Boehmer JP, et al, for the Heart Failure Society of America. Executive summary: HFSA 2010 comprehensive heart failure practice guideline. J Card Fail. 2010;16(6):e1-194.
8. Stiles S. FDA Approves Heart Sympathetic Activity Imaging Agent for HF Evaluation. Accessed April 5, 2016.
9. Braunwald E. The pathogenesis of heart failure: Then and now. Medicine. 1991;70:68.
10. Braunwald E, Ross J Jr, Sonnenblick EH. 2 ed. Mechanisms of Contraction of the Normal and Failing Heart. Boston: Little Brown & Co; 1976:417.
11. Kajstura J, Leri A, Finato N, Di Loreto C, Beltrami CA, Anversa P. Myocyte proliferation in end-stage cardiac failure in humans. Proc Natl Acad Sci U S A. Jul 21 1998;95(15):8801-5.
12. Sharma R, Francis DP, Pitt B, Poole-Wilson PA, Coats AJ, Anker SD. Haemoglobin predicts survival in patients with chronic heart failure: a substudy of the ELITE II trial.Eur Heart J 2004;25:1021-1028.
13. Horwich TB, Fonarow GC, Hamilton MA, Maclellan WR, Borenstein J. Anemia is associated with worse symptoms, greater impairment in functional capacity and a significant increase in mortality in patients with advance heart failure. J Am Coll Cardiol 2002;39:1780-1786.
14. Mozaffarian D, Nye R, Levy WC. Anemia predicts mortality in severe heart failure. The prospective randomized amlodipine survival evaluation (PRAISE). J Am Coll Cardiol 2003;41:1933-1939.
15. Groenveld HF, Januzzi JL, Damman K, Wijng aarden J, Hillege HL, van Veldhuisen DJ, and Meer PV, Anemia and Mortality in Heart Failure Patients. A Systematic Review and Meta-Analysis. J Am Coll Cardiol, 2008; 52:818-827
16. Mitka M. Researchers probe anemia-heart failure link. JAMA. 2003;290:1835–1838.
17. Hebert PC, Wells G, Blajchman MA, Marshall J, Martin C, Pagliarello G, Tweeddale M, Schweitzer I, Yetisir E. A multicenter, randomized, controlled clinical trial of transfusion requirements in critical care: Transfusion Requirements in Critical Care Investigators, Canadian Critical Care Tr ials Group. N Engl J Med. 1999;340:409–417
18. Ghali JK, Anand I, Abraham WT, et al. Randomized, double-blind, placebo-controlled trial to assess the impact of darbepoetin alfa treatment on exercise tolerance in anemic patients with symptomatic heart failure: results from STAMINA-HeFT. European Society of Cardiology Heart Failure 2006 Congress; June 17-20, 2006; Helsinki, Finland. Abstract 549.