

FREQUENCY OF ANEMIA IN PATIENTS ADMITTED WITH ACUTE DECOMPENSATED HEART FAILURE IN TERTIARY CARE CARDIAC HOSPITAL.

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Abstract.

Introduction:

Usually there is an association of cardiovascular diseases and various co-morbid diseases, but the one that is frequently associated but focused upon is anaemia. Anaemia occurs in more than 4% to less than 7% of the patients with acute decompensated heart failure.

Objective:

This study aimed to determine a statistical correlation between the occurrence of anaemia and acute decompensated heart failure. Also, to determine the existence of other comorbid diseases with anemia and find a correlation between them.

Methods:

Patients admitted in the period of year for a cardiovascular disease that is acute decompensated heart failure at IGIMS, Patna in a period of a year were considered as subjects for this study. There was a total of 100 participants, and their haemoglobin levels were tested. For men lesser than 12g/dL and women, lesser than 13g/dL were considered anaemic. The occurrence of anaemia was correlated to several co-morbid diseases and their significance was determined statistically.

Results:

The association of anaemia with cardiovascular diseases was significant statistically. If the patient was a smoker or was hypertensive or was diabetic the probability of anemia was high in such patients.

Conclusion:

The association of anaemia with cardiovascular diseases is significantly high. The anaemic patients in this study were generally men and were above 60 years of age. There were other co-morbid conditions with anemia which included diabetes mellitus 2 and hypertension.

Recommendation:

Intravenous (IV) Ferric Carboxymaltose (FCM) should be considered for the treatment of iron deficiency.

Keywords: Anaemia, cardiovascular diseases, comorbidity, acute decompensated heart failure,

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1. Introduction.

Owing to the sedentary lifestyle, cardiovascular diseases have become quite common, the oc-

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currence of one cardiovascular disease with other co-morbid conditions is usual. However, the association of anaemia with cardiovascular diseases is not much focused [1, 2]. In 2005 an international health committee for cardiovascular disease recognized the prevalence of anemia with cardiovascular diseases [3].

Patients with anaemia tend to have some or other cardiovascular problems [4, 5]. This is because, in the case of severe anaemia, the heart becomes hypoxic due to which the ability of the heart to pump blood decreases, which results in tachycardia, hypotension, and low cardiac output [6]. On the other hand, if the heart muscles are not hypoxic and other body tissues are hypoxic due to anaemia, the heart takes the load and pumps the blood which increases blood pressure [7]. The aetiology and association of anaemia with cardiovascular diseases may vary from subject to subject. Cardiovascular diseases cause a decrease in the blood supply to kidneys, which alters hematopoiesis and decreases the total RBC count which leads to anaemia [8]. Acute decompensated heart failure has been reported to be associated with anemia. Some studies have found that treatment of anaemia leads to successful treatment of heart failure [9, 10].

The hemodynamic changes that occur due to anaemia precipitate cardiovascular problems. Also, certain medication used in the treatment of heart failure causes a deficiency of iron and induces an inflammatory pathway which decreases the synthesis of erythrocytes in the body leading to anemia. So, the aetiology of comorbid diseases anaemia and heart failure is intricate and intertwined [11]. Clinical studies are required to correlate the occurrence of both these diseases, understand the aetiology, and derive a clinical treatment method to resolve both.

This study aims to determine a statistical correlation between the occurrence of anaemia and acute decompensated heart failure.

1.1. Objective.

To determine the existence of other comorbid diseases with anemia and find a correlation between them.

2. Method.

2.1. Study design and population.

The patients who belonged to class III and class IV heart failure were included in the study. These patients were admitted to IGIMS, Patna for the treatment of heart failure. The patients who had the following conditions such as gastric, renal, and blood malignancies, chronic kidney dysfunction, chronic liver dysfunction, and myocardial infarction were eliminated from the study. A total of 100 patients participated in the study, including both genders and the age range of 35-60 years old.

2.2. Data Analysis:

According to WHO guidelines women with less than 12 grams per deciliter and men with less than 13 grams per deciliter respectively, are considered anemic. A 5 ml blood sample was withdrawn from each participant and the amount of haemoglobin was determined in the blood sample

A questionnaire was prepared that included questions regarding the presence of another comorbid disease such as diabetes mellitus 2 and hypertension. The questionnaire was curated to stratify factors such as economic status, educational qualifications, and habits such as smoking. The data obtained was analyzed statistically, average age of patients and the amount of hemoglobin were calculated. The frequency of patients with different economic statuses, educational qualifications, and other comorbid diseases was determined.

2.3. Statistical Methods.

T-test and Pearson's value were used to determine the statistical correlation between the above-stated factors and the occurrence of anaemia.

3. Results.

This study included a total of 100 patients. At the initial stage a number of 200 patients were examined for eligibility, however 100 patients were excluded from this study due to not being eligible. When the average hemoglobin was calculated

for 100 patients participating in the study, it was found to be 11.77 grams per deciliter which is the prominent sign of anemia according to the WHO. However, since it is average and not the actual haemoglobin count for each patient, the number of women who had less than 12 grams per deciliter and men who had less than 13 grams per deciliter were considered anaemic and their frequency was determined. It was found that out of 100 patients, 64 patients had anaemia. The average age in years was 64.5 of the participants.

The majority of the patients (n=35) having heart failure and anaemia belonged to the lower economic class. However, most of them had secondary and higher (n=37) education. 57 patients were men amongst 100 patients. 50 patients were hypertensive, and 46 patients were diabetic. The prevalence of addiction was not common, but 10 patients among the 100 were addicted to smoking, and only one patient among the 100 was addicted to alcohol. All the patients were above the age of 35 and below the age of 80. Once the frequency of these demographics was determined it was correlated with the occurrence of anaemia as shown in Table no.1. The Pearson's value was calculated to find out the significance of the correlation with anaemia as illustrated in Table.1.

Pearson's value of less than 0.05 was considered to have a significant correlation. Thus, the correlation between smoke addiction and the existence of both comorbid diseases with anemia was found to be statistically significant.

4. Discussion.

In this study, it found that 63% of the patients having acute decompensated heart failure suffer from anaemia. Along with this high blood pressure is the most prevalent among patients with anemia and heart failure [12]. There was a statistically significant correlation between addiction and anaemia but the number of patients with addiction was much lesser and hence the significance of this correlation is not effective.

The number of patients with heart failure is increasing at a drastic speed in developing countries, it is no longer a disease of elderly patients

only. The prevalence of heart failure is now common among the young population as well. The admission of these patients does not guarantee a decrease in the chances of heart failure, rather the probability of rehospitalization increases substantially.

Heart failure is associated with co-morbid diseases like anaemia and hypertension. Studies have reported that treatment of other diseases can improve the chance of survival of the patients. One of the studies reported that erythropoietin when given to anaemic patients who had heart failure [13]. The hemodynamic vitals of the patients improved and their reliability on the diuretics for heart failure decreased. This demonstrated that early diagnosis of anaemia and treatment of it in patients with heart failure can help in the course of treatment of heart failure [14].

This study showed that anemia was associated with heart failure in a significant number of cases which is by other studies as well [15]. However, the other demographic factors such as economic status, level of education, gender and age were not significant.

5. Conclusion.

From the study, it is concluded that the prevalence of anaemia in patients of acute decompensated heart failure is about 60% and it is found to be associated with other comorbid diseases such as high blood pressure and diabetes mellitus 2. It is also found that the patients have a higher probability of developing anemia with heart failure if they are addicted to smoking.

6. Limitations.

This study has limitations because sampling calculations were not conducted, the haemoglobin count was taken as a baseline, the changes in the haemoglobin count were not determined, and the age was not broad. Thus, further studies are required to overcome these limitations.

Table 1: Comparison of demographics and their correlation with anemia

Parameters	Anemic	Non-anemic	Pearson's value
Sex			
Women	23	20	0.27
Men	40	17	
Age			
Above 60 years	44	14	0.15
Below 60 years	23	19	
Economic status			
Low	35	17	0.064
Moderate	29	18	
High	0	1	
Other comorbid condition			
Diabetes	46	21	0.02
Hypertension	50	24	0.03
Educational qualification			
No education	3	2	0.43
Primary	24	13	
Secondary and higher education	37	23	
Addiction			
Smoking	10	8	0.02
Alcohol	1	0	0.07

7. Recommendation.

Intravenous (IV) Ferric Carboxymaltose (FCM) should be considered for the treatment of iron deficiency.

8. Acknowledgment.

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9. List of abbreviations.

IV- Intravenous
 FCM- Ferric Carboxymaltose
 WHO- World Health Organization

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