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Anemia in Geriatric Patients with Cardiovascular Diseases; A Hospital Based Study

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ABSTRACT

Objective: To determine the prevalence of anemia in geriatric patients with cardiovascular disease along with the clinical and laboratory spectrum of patients with anemia and cardiovascular diseases and to assess the etiology and pattern of anemia in geriatric cardiovascular patients. **Method:** A prospective cross sectional study was conducted. All the geriatric inpatients older than 65 years of age and having cardiovascular diseases with or without comorbidities were included and those having prevalence anemia were assessed from this. Characteristics of anemia and its prevalence and etiology were identified. **Result:** A total of 138 patients were studied of which 62 patients were anemic. Prevalence of anemia was found to be 44.93%. Mostly observed clinical signs symptoms were pallor and weakness. Most common type of the anemia was normocytic anemia. The etiology of anemia which was predominant is iron deficiency followed by Anemia of chronic disease. **Conclusion:** The study has shown that anemia exists in nearly half of cardiovascular patients. Hence it is very inevitable to identify which one of them precedes. And anemia is to be considered more relevant and to be treated earlier as possible.

INTRODUCTION

Cardiovascular disease is the most recurring type of disease in elderly people and is the leading cause of death in both men and women older than 65 years of age. Cardiovascular diseases affect both heart and blood vessels which can be symptomatic or asymptomatic. Heart disease is the leading cause of death in US causing 6,47,000 deaths per year. The common causes include aging, genetic factors, scarring of muscle, infections. Behavioral factors also attribute to the disease. Common symptoms vary widely from chest pain up to palpitations.[1]

Anemia is a condition which co-exists in cardiovascular patients now a days. Anemia is defined as a reduction of hemoglobin in blood from normal quantity.[2] According to WHO criteria, amount of hemoglobin less than 13 gm% in case of males and 12 gm% in females is considered to be anemic. More than 10% community dwelling adults age 65 years and older has WHO defined anemia. NHANES III of WHO study revealed prevalence of anemia as 11% of men and 10.2% of women aged 65 years and older.[3] Anemia can be due to blood loss, trauma, hemorrhoids, nutrient deficiency, hormonal diseases, renal failure, carcinoma, genetics etc…

Aging can be associated with a progressive decline in hematopoietic reserve which make individuals more prone to developing anemia in case of hematopoietic stress. Dysregulation of proinflammatory cytokines like interleukin-6, may reduce EPO production or interact with EPO receptors[2]. Although Hb levels may remain normal, the diminished marrow may lead the elderly patients more susceptible to other cause of anemia. Renal insufficiency is commonly in elderly patients, may minimize the ability of the kidney to produce erythropoietin. Myelodysplastic syndrome is another common cause of anemia in elderly, but most common anemias are multifactorial. Based on morphology of the RBCs they are classified as microcytic, macrocytic and normocytic type.[4] Types which are mostly elderly people complaining about include Iron deficiency anemia and anemia of chronic disease. Anemia in elder patients usually is normocytic and mild with Hb values ranging between 10 and 12 g/dL. Elderly patients who are having high incidence of anemia are hospitalized. Undiagnosed and untreated anemia has been associated with adverse outcomes including hospitalization, hospitalization secondary to cardiovascular disease and mortality.[5] Anemic condition may become exacerbated to neurologic and cognitive conditions and affect quantity of life. Treating the underlying cause remains the main stay of pharmacological

treatment. Monitoring of treatment is generally as the adult population. A key component of symptom assessment among older adults is the main domain.[6]

MATERIALS AND METHODS

A prospective cross-sectional study was conducted from January 2022 to June 2022 at PVS hospital, Calicut, Kerala, after getting approval from Research Monitoring Committee. All geriatric patients having cardiovascular diseases during the study period has been selected. Cardiovascular inpatients of age 65 years and older with or without co morbidities was taken as inclusion criteria. Demographic details of patients were collected and data analysis was conducted using ANOVA and Chi-square test. Prevalence of anemia in cardiovascular patients was calculated using the formula.

RESULTS

A total of 138 patients were taken for this study.

The data of 138 cardiovascular disease patients were collected and analyzed. In this 66 were male and 72 were female patients. Majority of the cardiovascular disease patients (39.13%) were in the age group of 65-70 years. And the number were least in the age group of >85 (10.14%). Most of the male patients were from age group of 65-70 and 71-75(33.33%) and that of female patients were 65-70. The mean (±SD) age of total cardiovascular patients was 74.03± 7.56 years. The data of 62 anemic cardiovascular disease patients were got from collected data.

Age group (Year)	**Number of CVD Patients having Anemia**					
	Male	**Percentage %**	**Female**	**Percentage %**	**Total**	**Percentage %**
65-70	6	30	18	42.86	24	38.71
71-75	4	20	14	33.33	18	29.03
76-80	2	10	0	0	2	3.23
81-85	6	30	4	9.52	10	16.13
>85	2	10	6	14.29	8	12.90

The mean (±SD) age of total anemic cardiovascular patients was 74.42± 7.63years. The mean (±SD) age of total male anemic cardiovascular patients was 76.4± 6.62 years. The mean (±SD) age of total female anemic cardiovascular patients was 73.48± 7.90 years.

Prevalence of anemic patients was calculated with the help of data obtained from sample Collection.

$$\text{Prevalence} = \frac{\text{No. of patients with anemia} \times 100}{\text{No. of cardiovascular patients}}$$

$$= \frac{62 \times 100}{138}$$

$$= 44.93\ \%$$

Prevalence of anemia in male cardiovascular patients was found to be 30.3%. On the other hand it was found to be 58.33% in females. Presence of anemia in patients having cardiovascular diseases by gender wise were analyzed using Chi-Square test. The chi-square statistic is 4.2302. The p-value is .03971. The result is significant at $p < 0.05$.

HEMATOCRIT, HEMOGLOBIN AND MEAN CORPUSCULAR VOLUME

Parameter	Mean ± Standard deviation	Mean ± Margin of error (95% Confidence level)
Hematocrit (%)	30.43 ± 9.97	30.43 ± 2.48
Hemoglobin (g/dl)	8.94 ± 0.84	8.94 ± 0.21
Mean corpuscular volume (fL)	84.16 ± 8.35	84.16 ± 2.08

CLINICAL SIGNS AND SYMPTOMS OF ANEMIC PATIENTS

Signs and symptoms	Number of patients	Percentage
Weakness	48	80%
Shortness of breath	28	46.67%
Swelling of feet	13	21.67%
Headache	12	20%
Vertigo	20	33.33%
Palpitation	8	13.33%
Pallor	51	85%

In patients observed we could see that most of them had pallor followed by weakness and shortness of breath and so on. 85% of patients had pallor.

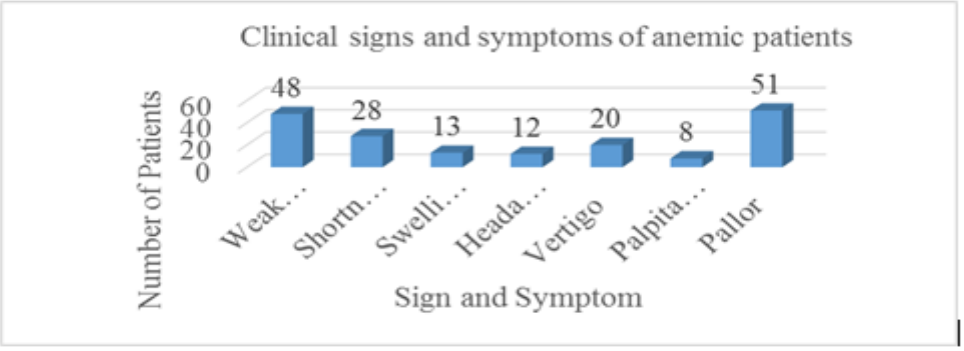

Fig. 1

MEAN CORPUSCULAR VOLUME BASED ANEMIA

Based on the mean corpuscular volume of various patients, the distribution of anemia is

	No of patients	percentage	No of patients	percentage	No of patients	percentage
Microcytic anemia	20	32.26	8	40	12	28.57
Normocytic anemia	40	64.52	12	60	28	66.67
Macrocytic anemia	2	3.23	0	0	2	4.76

Differences in the mean values were analyzed using the ANOVA test. The F ratio value is 54.3811. The p-value is <.00001. The result is significant at p<.05.

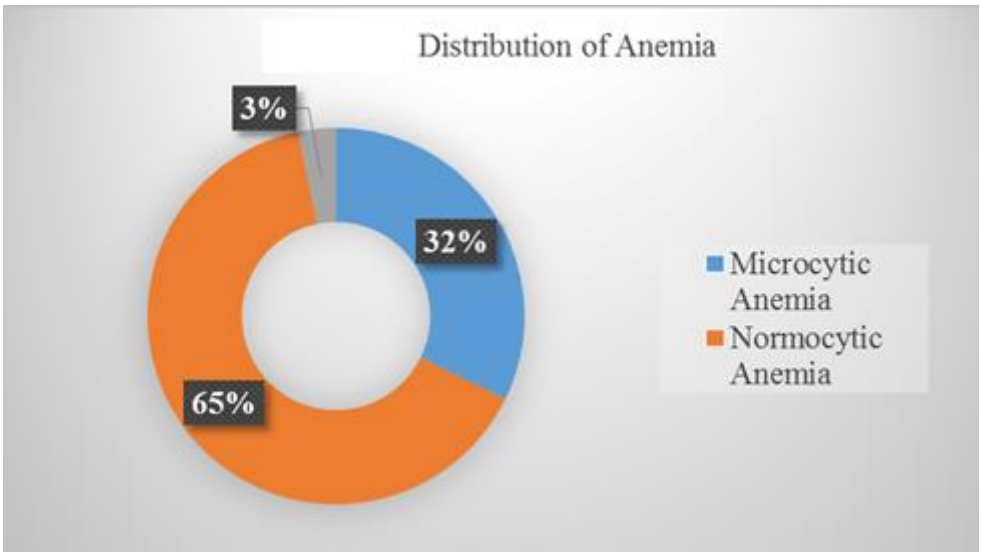

Fig. 2

ETIOLOGICAL DISTRIBUTION OF ANEMIA

Type	Number of patients	Percentage
Iron deficiency Anemia	15	24.19
Hemolytic Anemia	2	3.22
Aplastic Anemia	2	3.22
Anemia of chronic disease	14	22.5
Chronic kidney disease	8	13
Hypothyroidism	6	9.6
Mixed deficiency Anemia	5	8.06
Vitamin B12 Deficiency Anemia	1	1.61
Folate Deficiency Anemia	1	1.61
Unexplained Anemia	7	11.2

When evaluating the etiologic distribution of anemia, it is found that the most predominant type of anemia is iron deficiency anemia (24.19%) followed by anemia of chronic disease (22.5%).No etiology was seen in 11.2% of patients and hence classified them in unexplained type.

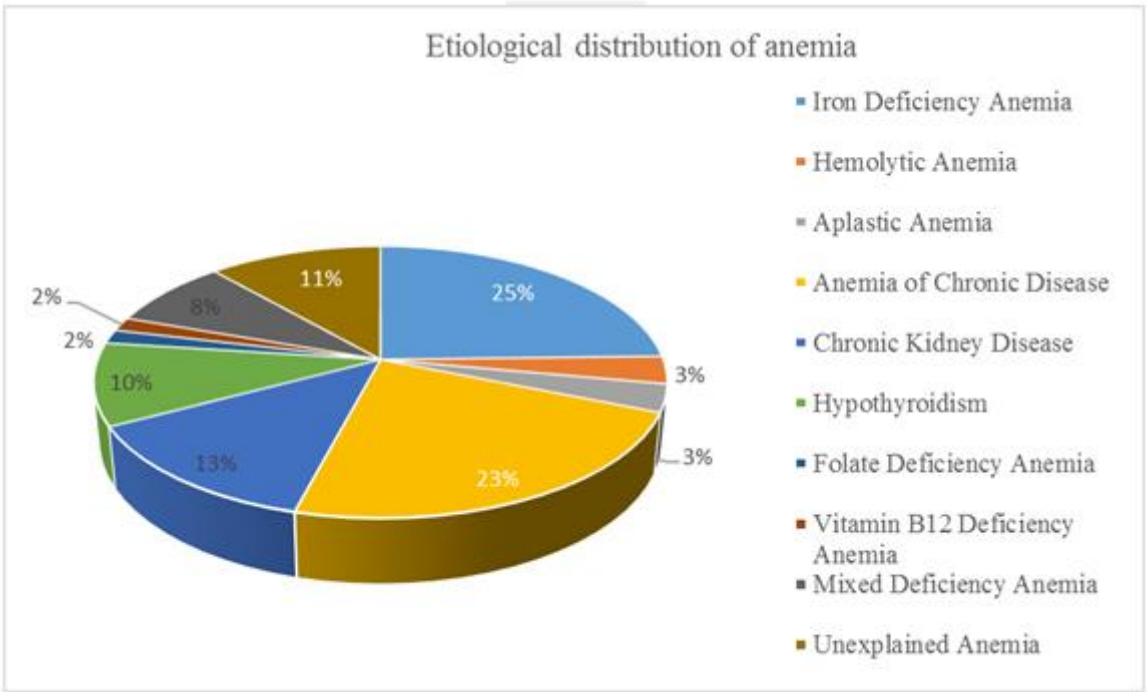

Fig. 3

DISCUSSION

The study showed that prevalence of anemia in cardiovascular geriatric patients was found to be 44.9%. It is more prevalent in geriatric males than females. This result is comparable to the study conducted by Ferruci L and Guralnik S.[7]

Elderly patients were at higher risk of developing anemia and has a treatable cause. It was found that the prevalence of anemia in geriatric patients with cardiovascular diseases is prominent compared to those without cardiovascular diseases. Majority of patients were found to have normocytic anemia. In general, normocytic and macrocytic anemia were more frequently seen in women than men, whereas microcytic anemia showed a male preponderance.

Normocytic anemia is the commonest type of anemia in elderly which was found in a study conducted in Maharashtra by Pravin N Soni et al. [8] Choi C W et al observed that macrocytic anemia was found to be 3%, which is comparable to our study.[9] The study showed that main etiology of anemia is iron deficiency and anemia of chronic disease and a fewer number of unexplained anemia were observed A study conducted on unexplained anemia by Artz AS stated that Most common etiology of anemia in elderly is iron deficiency (25.3%) which is consistent to our study result.[10]

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CONCLUSION

The present study was an overview on the anemia in elderly cardiovascular patients. The study came across various factors such as demographics, laboratory and clinical spectrum, therapy and pattern of drug use in patients included. Anemia was also diagnosed in some of them. By the study we are able to understand that anemia co exists in cardiovascular patients. But it is still unclear that whether anemia precedes or succeeds CVDs. Due to the increasing number of geriatric cardiovascular patients, physicians require greater attention to evaluate and manage common but a severe condition such as anemia which may increase morbidity and mortality in geriatric cardiovascular disease patients.

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