

Original Research Article

Assessment of anemia in cases of acute myocardial infarction in a tertiary care hospital in central India

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ABSTRACT

Background: Anemia is a known risk factor for ischemic heart disease and heart failure. It is also associated with increased mortality in acute myocardial infarction (AMI) patients. The study aimed to determine the anemia status of AMI patients and educate them on anemia and its impact on health.

Methods: This was cross-sectional study conducted among 100 AMI patients admitted to ICCU of Hamidia hospital, Bhopal over 2 months. Haemoglobin levels were recorded and patients classified as non-anemic, mildly, moderately or severely anemic based on WHO criteria. Patients' sociodemographic profile and risk factors also collected.

Results: Of the 100 patients (mean age 55.6 years), 76% were males. 88% patients had anemia-74% mild, 13% moderate and 1% severe. The 30-45 years age group reported the highest frequency of mild anemia cases (20 out of 31). Absence of anemia was highest among the younger <30 years group (9 out of 31). Anemia was higher in females, Patient with vegetarian diet had comparatively more anemia than the patient consuming mixed diet.

Conclusions: A high prevalence of anemia was found among AMI patients. Counselling can help improve health by increasing awareness of anemia management. Screening AMI patients for anemia and therapeutic interventions were recommended.

Keywords: MI, Anemia, Haemoglobin, Risk factors, Screening

INTRODUCTION

The world health organization (WHO) defines MI as the presence of myocardial cell necrosis as a result of substantial and prolonged ischemia. It is typically, but not always, an acute sign of coronary heart disease caused by atherosclerosis.¹ First of all heart attacks, also known as AMIs, are one of the main causes of death and morbidity in the globe. One of the most frequent cardiac events that can be fatal is an AMI. Every year, over 3 million patients get ST-elevation MI (STE-MI), and over 4 million people have STE-MI pathology. MI is more common worldwide

in people under 60 than in people over 60, with a 3.8% frequency in the latter group.²

The WHO defines anemia as a disorder in which the concentration of hemoglobin in red blood cells is below normal or in which there is a decrease in the number of red blood cells. Anemia can cause a number of symptoms, including weakness, exhaustion, lightheadedness, and dyspnea. The ideal concentration of hemoglobin required to meet physiological requirements varies depending on factors such as age, gender, altitude of habitation, smoking status, and pregnancy. The most frequent causes

of anemia are haemoglobinopathies, dietary deficiencies, especially those related to iron, folate, vitamins B12 and A, and infectious illnesses such HIV, malaria, TB, and parasite infections.³

After an AMI, anemia may negatively impact healing and prognosis. It can worsen pre-existing heart issues and puts more strain on the heart.⁴ Furthermore, tissue hypoxia brought on by the blood's decreased ability to deliver oxygen might result in organ damage and cellular energy failure. Anemia poses major dangers, both mild and moderate to severe, and is also linked to higher mortality following AMI.⁵ When combined with either acute renal injury or chronic kidney disease, hospital-acquired anemia is a reliable indicator of long-term mortality in patients with AMI.⁶

In patients with acute coronary syndrome (ACS), anemia can independently predict major adverse cardiovascular events (MACE) and is a recognized risk factor for ischemic heart disease.⁷ Anemia is associated with severe morbidity and impairment and has been recorded in around 40% of individuals with acute ischemic stroke (AIS).⁸ Anemia can worsen the healing process following a MI by raising the heart workload, causing tissue hypoxia, and increasing mortality.⁹⁻¹¹ Consequently, it makes sense that treating anemia will lessen these issues and produce better results. This study aims to ascertain the burden of anemia in these high-risk patients because anemia screening is not routinely performed for all AMI hospitalizations and its impact is still poorly understood.

METHODS

It was descriptive cross-sectional study conducted in the tertiary care hospital of Jabalpur for period of 2-month duration from October 2017 to November 2017.

Study subjects

Patients of AMI admitted to the intensive coronary care unit (ICCU) of a tertiary care hospital.

Sample size

A total of 100 patient with recent myocardial infraction were approached in the ICCU of hospital.

Sampling method

Non-probability purposive sampling method was used. The first 100 consenting subjects who fit the inclusion criteria were enrolled in the study.

Study tools and techniques

A pre-tested, semi-structured questionnaire was designed to collect patients' socio-demographic details, Dietary habits, patients' most recent hemoglobin level recorded as part of routine investigations during hospital admission to

classify anemia status. Data were taken after taking consent from the patient during their hospital stay using study questionnaire and collecting relevant information from case sheets. If patient were not in conditioned to understand or respond to our questions, in that case the information has been taken from the patients relative. Patients were classified as non-anemic or having mild, moderate or severe anemia based on Hb levels and WHO criteria for anemia diagnosis.¹⁰

Criteria for classification of anemia: Hb concentration- >12 gm%-no anemia, 9-11.9 gm%-mild anemia, 7-8.9 gm%-moderate anemia, <7 gm%-severe anemia

Ethical consideration

A formal permission letter seeking approval from the institutional ethics committee and hospital administration was obtained to conduct the study.

Data analysis

The data analysis in the study was carried out using descriptive statistics and graphical representation. Frequency distribution and percentages were calculated for categorical variables to describe the socio-demographic characteristics of respondents. Crosstabulation of sociodemographic and Anemia status were done to look into possible relation.

RESULTS

Of 100 respondents enrolled in the study, majority were males (76%), in age group of 45-60 years (33%) followed by 60-75 years (28%). Most common occupations included labourers (29%) and housewives (24%) while majority resided in rural areas (52%). Over three-fourths of respondents possessed poverty identification cards showing their lower socioeconomic status.

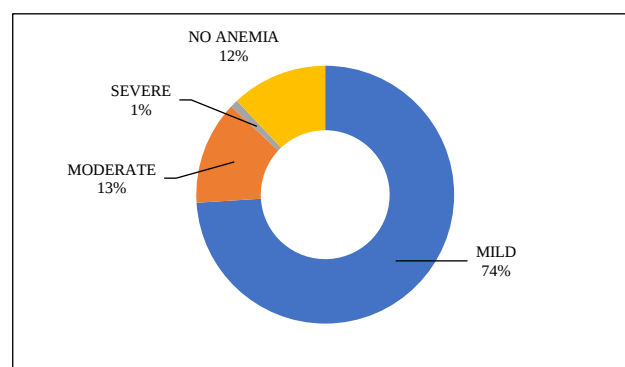


Figure 1: Status of anemia in respondents.

The pie chart depicting the status of anemia among the 100 respondents showed that majority (88%) of them were anemic. Of the anemic patients, most (74%) had mild anemia while 13% had moderate anemia. Severe anemia was present in 1% of respondents only.

Table 1: Demographic details of the patients, (n=100).

Variables	N
Sex	
Male	76
Female	24
Age group (In years)	
<30	3
30-45	31
45-60	33
60-75	28
>75	5
Occupation	
Laborer	29
Farmer	12
Business	12
Housewife	24
Others	23
Residence	
Rural	52
Urban	48
BPL	
Yes	80
No	20
Diet	
Vegetarian	79
Mixed	21
Total	100

Table 2: Classification of anemia in respondents according to age groups.

Variables		Anemia				Total
		Mild	Moderate	Severe	Absent	
Age group (In years)	<30	2	1	0	0	3
	30-45	20	2	0	9	31
	45-60	24	6	1	2	33
	60-75	24	3	0	1	28
	>75	4	1	0	0	5
Gender	Male	62	4	0	10	76
	Female	12	9	1	2	24
Diet	Vegetarian	64	11	1	3	79
	Mixed	10	2	0	9	21
Total		74	13	1	12	100

The classification of anemia across different age brackets revealed that mild anemia was most prevalent across all age groups. The 30-45 years age group reported the highest frequency of mild anemia cases (20 out of 31). For moderate anemia, the 45-60 years group had the maximum number of cases (6 out of 33), followed by 60-75 years (3 out of 28). The single case of severe anemia belonged to the 45-60 years category. Absence of anemia was highest among the younger <30 years group (9 out of 31), followed by the oldest >75 years group (0 out of 5). Mild anemia predominated across all ages with severity being higher in the middle-aged 45-60 years group among this sample of AMI patients.

DISCUSSION

We discovered that anemia affected an astounding 88% of patients with AMI. However, 30% of rural boys in northern India were found to be anemic in the Singh et al study.¹² Both the current analysis and the Salisbury et al studies found that anemia was highly prevalent in patients with AMI. 45.4% of patients had hospital acquired anemia (HAA), according to Salisbury et al.¹³

Comparable to the current study, which discovered that 74% of AMI patients had mild anemia, Farhan et al review numerous other investigations that found anemia

to be quite prevalent in ACS situations.¹⁴ For instance, they mentioned that over 40,000 patients with ACS had an overall anemia prevalence of 28% according to Mamas et al.¹⁵

Both mild and moderate to severe anemia significantly increased mortality rates compared to patients without anemia, according to a study using the MONICA/KORA MI registry.¹⁶ This is consistent with our observation that mild anemia was the most common in all age categories, with the 30- to 45-year-old age group reporting the highest incidence of instances of mild anemia.

According to a study by Gaskell et al older people-especially those who were hospitalized or lived in nursing homes-had a higher prevalence of anemia.¹⁷ This is in line with our discovery that 27% of the cases of anemia were in the 60-75 age group. According to a study conducted in rural India, the prevalence of anemia rose with age, which is consistent with our results showing that the younger <30 years old group had the highest absence of anemia.¹⁸

According to a study by Camaschella iron deficiency is the most common cause of anemia, and dietary iron consumption can significantly affect iron storage and anemia status.¹⁹ The majority of anemic patients in our study (74 out of 88) had diets that were either deficient in iron-rich food sources or absent from them.

Limitations

As it was a cross-sectional design it can only provide a snapshot of data at a single point in time, limiting the ability to establish causality or understand changes over time. Also, the study has small sample size that may limit the generalizability of the findings to a larger population. A longitudinal study would be appropriate to establish the causal relationship.

CONCLUSION

This study discovered that among patients admitted with AMI, anemia was highly prevalent, mostly of mild severity. Of the patients, an alarming 88% had anemia, of which 74% had moderate anemia. Anemia was more common in some patient groupings, such as middle-aged and female patients. There was a definite correlation found between anemia and low dietary iron intake. The cross-sectional design of the study posed limitations, but the results underscore the importance of identifying individuals at risk and assessing anemia in AMI admissions. Counseling sessions were successful in increasing knowledge about the management of the anemia.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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