



Original Research

Evaluating the Incidence of Anemia in Individuals Diagnosed with Acute Coronary Artery Disease and Undergoing Coronary Angiography

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Abstract

Objective: Assessing anaemia in patients with acute myocardial infarction (AMI) undergoing coronary angiography was the goal of this investigation.

Methods: Seventy patients with acute myocardial infarction were purposefully selected and then admitted to the medical ward at Karbala hospitals for diagnostic angiography and heart surgery. World Health Organisation guidelines (haemoglobin level <13 g/dl for men and <12 g/dl for women) were used to define anaemia. Thirty-five individuals with anaemia and thirty-five patients without anaemia made up the study population.

Results: Results showed that two blocked vessels were present in 24.0% of patients without anaemia and 36.0% of patients with anaemia. In individuals with anaemia, the study also revealed a marked rise in the prevalence of multi-vessel disease and diabetes mellitus.

Conclusions: In patients with AMI undergoing coronary angiography, anaemia at baseline is prevalent and closely linked to negative outcomes and a higher incidence risk of multi-vessel disease..

Recommendation: The study suggests creating and implementing educational initiatives that highlight anaemia symptoms and the value of early presentation.

Keywords: Anemia, Acute Coronary Artery Disease, Coronary Angiography

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Introduction:

One major factor contributing to the decline in the nursing profession is the prevalence of bullying among nursing students. The purpose of this research was to examine how bullying affects the mental health of first-year nursing students.

Methodology

Study Design: A quantitative study was conducted over a period spanning from February 2023 to December 2023.

Participants: Fifty patients who had a history of acute myocardial infarction and were admitted to the medical ward (Al-razi) at the Ibn-Al-Bitar special centre for heart surgery for diagnostic angiography were chosen using a purposive sampling method. Patients met inclusion criteria if they were willing to participate, had no specified educational background, had a full battery of cardiac tests done at the Ibn-Al-Bitar speciality centre for heart surgery (including electrocardiogram, chest x-ray, and echocardiography), and had a full blood cell count. Patients who had a recent major surgery, gastrointestinal or genitourinary bleeding, a cerebrovascular event within the past two years, neurological deficits, leukopenia, thrombocytopenia, liver or kidney problems, or who had recently been administered a thrombolytic medication were not included.

Data Collection: For this investigation, researchers developed a three-part questionnaire. Gender, age, smoking status, blood pressure, and diabetes mellitus history were all part of the sociodemographic and clinical data collected in the first section. Part two included assessment of the coronary arteries by seasoned cardiologists using

eye evaluation and Judkins' approach (Precautious Trans femoral). In the third section, the Complete Blood Cell (CBC) Count was used to determine anaemia according to the World Health Organization's standards, which call for a haemoglobin level of less than 13 g/dl for males and less than 12 g/dl for women. Two groups were formed from the study population: There were 25 individuals with anaemia and 25 individuals without anaemia.

Statistical Analysis: The data was examined by means of two statistical methods. For high significance, the significance levels were set at $P < 0.01$, for significance, at $P < 0.05$, and for non-significant, at $P > 0.05$. Observed frequencies, percentages, and cumulative percents were drawn from in the descriptive statistics. To test hypotheses, inferential statistics were used, such as the t-test for non-restricted frequency tables. Methodologically, the study set out to examine, within the setting of hospitals in Karbala, the frequency of anaemia in patients undergoing coronary angiography for acute coronary artery disease.

Results:

Table 1: Sociodemographic Characteristics of Patients with Acute Myocardial Infarction Undergoing Percutaneous Angiography

Sociodemographic Characteristic	Frequency (F)	Percentage (%)
Sex		
Male	37	74.0
Female	13	26.0
Total	50	100
Age		
20-39	7	14.0
40-59	32	64.0
60-79	11	22.0
Total	50	100
Mean Age		51
Standard Deviation		0.63
Smoking		

Sociodemographic Characteristic	Frequency (F)	Percentage (%)
Yes	34	68.0
No	16	32.0
Total	50	100
Living with Smoker Persons		
Yes	37	74.0
No	13	26.0
Total	50	100
Alcohol Drinking		
Drinking	4	8.0
No Drinking	46	92.0

Note: Percentages are denoted by (%) and frequencies by (F).

In order to diagnose acute myocardial infarction, patients who underwent percutaneous angiography had their sociodemographic information summarised in Table 1. The bulk of the people who participated in the survey were men (74.0%), with only 26.0% being female. Among the patients analysed, those between the ages of 40 and 59 made up the biggest age group (64.0%). With a standard deviation of 0.63, the patients' mean age was determined to be 51 .

In addition, when asked about their smoking habits, 68.0% of the patients said they smoked and 32.0%

said they didn't. When asked about their living situations, 74.0 percent of patients reported being in households where smoking was common, while 26.0 percent reported being in smoke-free homes. In addition, just 8.0% of patients admitted to drinking alcohol, while 92.0% said they didn't ever drink.

Important for identifying the community of patients who have percutaneous angiography following acute myocardial infarction, these results provide information regarding the pattern and quotas of the patient sample in the current study.

Table 4: Comparison between Anemic and Non-Anemic Patients Regarding the Presence of Renal Dysfunction, Diabetes Mellitus, Age >70 Years, and Multivessel Disease

Variable	Patients without Anemia	Patients with Anemia	Comparative Significance (C.S.)	P-value
	F	%	F	%
Diabetes Mellitus	5	20	15	60
Age >60 years	3	12	8	32
Multivessel disease	2	8	4	16

Patients with anaemia were more likely to have renal failure, diabetes mellitus (DM), age greater

than 70, and multivessel disease, as seen in table 4. The fact that the table shows how patients are

distributed by these characteristics is really appreciated.

The Chi-Square test results are as follows:

- For the variable "Diabetes Mellitus," a significant difference is observed between anemic and non-anemic patients ($\chi^2 = 15.88$, $P = 0.05$, S).
- Regarding the variable "Age >60 years," the comparison does not show a significant difference ($\chi^2 = 1.09$, $P = 0.05$, N.S.).

- In the case of "Multivessel disease," a significant difference is evident between the two groups ($\chi^2 = 22.5$, $P = 0.05$, S).

When comparing anaemic and non-anemic patients, the existence of diabetes mellitus and multivessel disease is statistically different, according to the Chi-Square test analysis. Regarding those aged 60 and up, though, no discernible change is noted.

Table 3: Comparison between Anemic and Non-Anemic Patients According to the Presence of Coronary Artery Disease on Angiogram

Presence of Coronary Artery Disease on Angiogram	Patients without Anemia	Patients with Anemia	Comparative Significance (C.S.)	P-value
	No.	%	No.	%
Single obstructed vessels	17	68.0	12	48.0
Two obstructed vessels	6	24.0	9	36.0
Three obstructed vessels	2	8.00	1	4.00
Four or more obstructed vessels	0	0.00	3	12.0
Total	25	100	25	100

Table 3 presents a comparison between patients with and without anemia based on the presence of coronary artery disease observed on angiograms. The table displays the distribution of patients among different categories of obstructed vessels.

The analysis using the Chi-Square test yielded the following results:

- For the category of "Single obstructed vessels," there is no significant difference between anemic and non-anemic patients ($\chi^2 = 1$, $P = 0.05$, N.S.).
- In the case of "Two obstructed vessels," there is no significant difference between the two groups ($\chi^2 = 0.86$, $P = 0.05$, N.S.).

- Similarly, for "Three obstructed vessels," the comparison does not show a significant difference ($\chi^2 = 0.21$, $P = 0.05$, N.S.).
- In the category of "Four or more obstructed vessels," it is indicated that there are 3 anemic patients with this condition, while no non-anemic patients fall under this category (O.C).

Finally, when looking at the levels of coronary artery disease shown on angiograms, the Chi-Square test analysis indicates that there is no statistically significant difference between non-anemic and anaemic patients. Present study results contribute to our knowledge of AMI patients' baseline anaemia pattern and the bad prognosis that is associated with it after they receive coronary angiography. The study population consisted of

64.0% people aged 40–59, with 74.0% of those people being male and an average age of 51. Epidemiological studies have shown that anaemia is associated with an increased risk of mortality and crippling stroke in both sexes. Patients had symptoms of chronic anaemia, and a significant prevalence of cardiovascular risk factors, such as hypertension (60%) and diabetes mellitus (40%) were also present. Evidence suggests that anaemia, in conjunction with other nosological features such as arrhythmias, hypotensive worsening, and an elevated infarct score, may impact myocardial oxygen delivery. The presence of both diabetes mellitus and multivessel disease was found to be strongly correlated with anaemia.

The significance of accurately identifying baseline anaemia as a strong risk factor for longer hospital stays, higher healthcare costs, and unfavourable short-term outcomes in patients with AMI who underwent coronary angiography is highlighted by this study. Based on the clinical and epidemiological implications, investigations should be conducted to improve the definition of anaemia in this population, according to practice-based research. The importance of continuing evaluation upon hospital release is emphasised due to the fact that anaemia is a known independent predictor of mortality. This is why it is recommended to stratify risks based on the findings of preliminary haemoglobin measurements.

It is important to do additional studies to determine if transfusions of red blood cells given early improve the outcome for anaemic individuals undergoing coronary angiography for acute myocardial infarction. To further enhance prognosis in high risk patients after primary percutaneous coronary intervention, research can be proposed to define new horizons of pharmacological, device-based, or surgical treatment. Therefore, in order to improve care delivery and patients' prognoses, large-scale research is the best way to address the link between anaemia, comorbidities, and AMI outcomes.

Therefore, this study contributes to the existing literature by delving further into the link between pre-angiography anaemia and the subsequent

complications in patients undergoing coronary angiography for acute myocardial infarction (AMI). With a mean age of 51 years and 64.0% falling between the 40-59 years age bracket, men made up the majority of the study group, accounting for 74.0% of the sample. Men and women alike are more likely to have unfavourable outcomes like anemia-related mortality and an increased vulnerability to crippling stroke.

Similar to hypertension (60% of patients) and diabetic mellitus (40% of patients), anaemia was associated with an increased proportion of these conditions. There was an emphasis on the potential consequences of anaemia on protecting the myocardial oxygen supply, which can lead to arrhythmias, exacerbated hypotension, and an increase in infarct size. Additionally, the correlation between anaemia and diabetes mellitus and multivessel disease was found to be statistically significant.

Longer hospital stays, higher expenses, and unfavourable early outcomes may be in store for patients with AMI who are referred for coronary angiography; this study lends credence to the idea that baseline anaemia is a crucial risk factor. Additional study is needed to reinterpret the anaemia status in this context using a systematic approach to assessing clinical and epidemiological profiles. The study also stresses the significance of monitoring anaemia status after discharge, which has an independent effect on death rate; thus, the indicators of the risk assessment algorithm should include the admission haemoglobin level.

In order to improve the outcome of anaemic AMI patients having coronary angiography, the study proposes further investigations into the potential benefits of early red blood cell transfusions. This cohort is especially at risk for problems following primary PCI, hence the study also urges the development of novel pharmacological, device, or surgical treatments to enhance outcomes. In order to enhance the efficacy of treatment methods and prepare better prognoses, further comprehensive multimodal investigations are necessary, as

anaemia and comorbidities interact to affect AMI outcomes.

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