Risk Factor of Non-ST-Elevation Myocardial Infarction among Young Patients in Erbil/Iraq

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Conflict of interest
None declared by author

ABSTRACT

Background: *The leading cause of mortality worldwide is coronary artery disease. It is a significant health and economical problem in the modern world. Despite the fact that myocardial infarction is relatively uncommon in individuals younger than 40 years of age (2%), they're not entirely immune to it. Approximately two-thirds of patients with myocardial infarction have non-ST-segment elevation. Ischemic heart disease development and incidence are significantly influenced by individual and combined risk factors.*

Objective: *The aim of this study was to investigate the risk factors of young age patients diagnosed with non-ST-elevation myocardial infarction in Erbil province, Iraq.*

Patients and Methods: *This was a Cross sectional study. Convenience sampling method was used to recruit young patients, ages between (15–47 years of age) diagnosed with non-ST-elevation myocardial infarction. The prevalence rates of the major risk factors (hypertension, smoking, hyperlipidemia, diabetes mellitus, and a positive family history of MI) were calculated for the entire sample with regard to gender. Chi-square test was used for comparison and odds ratio was calculated for each risk factor with regard to gender.*

Results: *The most common risk factor was smoking comprising 49.2% of patients. The second most common risk factor among our study population was hypertension accounting for 43.3% of cases. This was followed by family history of ischemic heart disease 36.7%, dyslipidemia 31.7%, diabetes mellitus 29.2%, and lastly past medical history of ischemic heart disease which was found in 19.2% of our cases.*

Conclusion: *Young patients who participated in this study had a high prevalence of modifiable atherosclerotic risk factors. It is quite likely that preventative actions will be successful. With the aid of these data, high-risk groups can plan the necessary preventative measures to lessen the impact of ischemic heart disease*

Keywords: Myocardial infarction (MI), NSTEMI, Coronary artery disease (CAD), risk factors.

1. INTRODUCTION

he leading cause of mortality worldwide is coronary artery disease. It is a significant health and economical problem in the modern world (1). Among the most frequent manifestations of coronary artery disease (CAD), acute coronary syndrome (ACS) comprises unstable angina, ST-segment elevation myocardial infarction (STEMI), and non-STEMI (NSTEMI) (2). Despite the fact that myocardial infarction is relatively uncommon in individuals younger than 40 years of age (2%), they're not entirely immune to it (3). Furthermore, the outcome of MI has a significant financial burden on the patients and their families due to the loss of productive age groups. Data shows that the prevalence of NSTEMI is rising, approximately 70% of patients with Acute coronary syndrome (ACS) have non-ST-segment elevation (NSTEMI) (4, 5). Despite having less significant coronary artery disease and small-sized infarcts, patients diagnosed with NSTEMI need thorough counseling regarding the importance of compliance to medication as well as lifestyle changes that will aid in prevention of repeat events and improve morbidity as well as mortality (5). One of the essential lifestyles changes is smoking cessation (5). Ischemic heart disease development and incidence are significantly influenced by individual and combined risk factors. There are modifiable and non-modifiable risk factors for coronary artery disease. The modifiable risk factors include hypertension, diabetes mellitus, dyslipidemia, smoking, and obesity. The nonmodifiable risk factors like age and gender are also important (6-9). Preventive strategies are likely to be effective in young age group. Therefore, our aim in this study was to investigate the risk factors of young age patients diagnosed with non-ST-elevation myocardial infarction in Erbil province, Iraq.

2. METHODOLOGY

This was a Cross sectional study. Convenience sampling method was used to recruit young patients, ages between (15–47 years of age) diagnosed with NSTEMI. Verbal consent was obtained from all patients. The prevalence rates of the major risk factors (hypertension, smoking, hyperlipidemia, diabetes mellitus, and a positive family history of MI) were calculated for the entire sample with regard to gender. Chi-square test was used for comparison and odds ratio was calculated for each risk factor with regard to gender.

Inclusion criteria

All patients between the ages (15-47 years) diagnosed as NSTEMI, which is determined based on typical test findings like: troponin levels, and electrocardiographic findings like: T-inversion and ST-segment depression.

Exclusion criteria

• Pediatric age group (<15 years of age)

• Elderly age group (>47 years of age)

• Patients with congenital heart disease, cardiomyopathy, myocarditis, Takayasu's arteritis, vascular dysplasia, coronary artery embolism, aortic dissection, severe aorta valve stenosis, myocardial hypertrophy, and a history of acute myocardial infarction without evidence of coronary artery narrowing were excluded.

Data collection

Demographic and baseline data were collected using a questionnaire during patient interviews and by reviewing medical records. The risk factor profiles for CAD were examined in the patients' medical records. The baseline data included gender, age, a history of smoking, a family history of coronary artery disease (CAD), a medical history of hypertension, type II diabetes mellitus, cranial vascular accidents, and the presence of other illnesses. Troponin T (normal range 0.05-0.40 ng/mL) tests were done.

There were four sections to the questionnaire. In the first section, we gathered demographic information. The age, gender, marital status, and place of residence of each patient were noted in this section. The patient's presenting complaint at the time of admission, past medical history, and patient family history were all included in the second section of the questionnaire. This included prior histories of ischemic heart disease, dyslipidemia, hypertension, diabetes mellitus, and family histories of the aforementioned illnesses. the third section, we. gathered social history, such as smoking and exercise habits. The fourth and final section was used to document each patient's cardiac enzyme test results and ECG abnormalities.

Statistical analysis

All data analysis was carried out using SPSS 25.0 software (SPSS Inc., Chicago, IL, USA). Numerical data with a normal distribution are presented as means with standard deviation, and intergroup comparisons were made using the Chi square tests. Odds ratio was calculated for each risk factor taking gender into account.

3. RESULTS

A total of 120 patients were enrolled in this study. The mean age of patients was 41.85 ±5.98 years. There were 75 (62.5%) males and 45 (37.5%) females among the study population. The mean age of men was 42.23±5.557 years and the mean age of women was 41.22±6.52 years. Approximately 89 (74.2%) of the patients were from urban areas while 31 (37.5%) were from rural areas. The majority of the patients 115 (95.8%) were married (**Table 1**). The most common risk factor was smoking comprising 49.2% of patients. The second most common risk factor among our study population was hypertension accounting for 43.3% of cases. This was followed by family history of ischemic heart disease 36.7%, dyslipidemia 31.7%, diabetes mellitus 29.2%, and lastly past medical history of ischemic heart disease which was found in 19.2% of our cases (**Table 2**). The prevalence of smoking among men vs. women was very close to each other. The percentage of male smokers was 49.3% among men, while the percentage of female smokers was 48.9% among the female participants. Meanwhile, hypertension was more common among females (53.3%) than males (37.3%). The gender distribution, comparison of all risk factors, as well as odds ratio for each risk factor is shown in (**Table 3**). The most common ECG finding was T inversion found in 52.5% of patients while the remaining ECG finding was ST-depression in 47.4% of patients. T inversion was more common in males which was found in 54% of males and 44.4% of females. Furthermore, ST depression was more common in females accounting for 48% of females while the percentage in males was 44%. About 43 % of patients had a positive Troponin level and the most common clinical presentation was chest pain. More males (53.3%) than females (24.4%) had positive Troponin levels (P value= 0.002). Lastly, most of the patients (95%) were physically inactive.

Table 1. Baseline characteristics

Variables		No.	%
Gender	Male	75	62.50
	Female	45	37.50
Age	Mean	41.85±5.94	
	Minimum	29 years	
	Maximum	47 years	
Residency	Urban	89	74.20
	Rural	31	25.80
Marital status	Single	5	4.20
	Married	115	95.80
	Divorced	0	0
	Widowed	0	0

Table 2. Risk factors of NSTEMI in the study population

Risk factor	No.	%
Hypertension	52	43.3
Diabetes Mellitus	35	29.2
Dyslipidemia	35	29.2
Ischemic heart disease	23	19.2
No past medical history	31	25.8
Family history	44	36.7
smoking	59	49.2

Table 3. Gender distribution of risk factors.

Risk factors	Male (n=75)		Female (n=45)		OR (95% CI)	P. value
	No.	%	No.	%	Male/Female	
Hypertension	28	37.3	24	53.3	0.52 (0.246-1.1)	0.087
Ischemic heart disease	12	16.0	11	24.4	0.589 (0.235-1.48)	0.255
Diabetes Mellitus	22	29.3	13	28.9	1.022 (0.453-2.31)	0.95
Dyslipidemia	23	30.7	15	33.3	0.885 (0.401-1.950)	0.761
Family history of ischemic heart disease	32	42.7	12	26.7	2.047 (0.916-4.571)	0.078
Smoking	37	49.3	22	48.9	1.018 (0.486-2.132)	0.962

OR: Odds ratio

4. DISCUSSION

In our study, the most common encountered risk factor was smoking (49.2% of all participants). This finding is in accordance but lower in comparison with a study conducted by Mrsic et al. in which smoking was reported in 65% of all participants (10). Although, similar to Mrsic et al.'s study (10) we found that smoking was more common in men (49.3%) than women (48.9%) but it was only by a small difference. Hypertension is a significant risk factor for ischemic heart disease. Previous studies have shown that people with hypertension are three times more likely to develop cardiovascular disease in comparison to normotensive individuals. In this study, we found that 43.3% of patients were hypertensive. This finding was in line but lower than previous studies (10, 11). With regard to gender, hypertension was more prevalent among women (53.3%) than men (37.3%). The third most common encountered risk factor in this study was a positive family history of ischemic heart disease accounting for 36.7% of the total study population. A positive family history of ischemic heart disease was more common in men (42.7%) than women (26.7%). This finding was also in accordance with previous studies (10).

The next risk factor in row is dyslipidemia, which was found in 31.7% of the patients. This was significantly less previous studies (12). Dyslipidemia was more common among females

(33.3%) than males (30.7%). This finding was in contrast with other studies (12). In our study, diabetes mellitus was found in 29.2% of patients. This finding suggests that diabetes mellitus was more prevalent in our study than in previous studies where the percentage of diabetes mellitus was found to be 22.6%. In this study, diabetes mellitus was more common in men (29.3%) than women (28.9%) by a small difference (12). The relationship between gender and troponin level is not statistically significant but we found that a positive troponin level was more common in males than females (53.3% vs. 24.4%). It's worth mentioning that about 26% of cases had no previously known past medical history.

Limitations

A higher sample size is necessary to guarantee a realistic distribution of NSTEMI risk factors among young adults. Additionally, we lack information on every identified risk factor for MI, including BMI and obesity. Obesity has been linked to an increased risk of MI; however, this risk is far lower than that of smoking and other cardioembolic risk factors such hypertension, diabetes, and dyslipidemia.

5. CONCLUSIONS

We draw the conclusion that these young patients had a high prevalence of modifiable atherosclerotic risk factors. It is quite likely that preventative actions will be successful. With the aid of these data, high-risk groups can plan the necessary preventative measures to lessen the impact of ischemic heart disease. We suggest that further studies be implemented to plan appropriate strategies for the future to decrease the risk of myocardial infarction in the total population.

Ethical Approval:

All ethical issues were approved by the author. Data collection and patients enrollment were in accordance with Declaration of Helsinki of World Medical Association , 2013 for the ethical principles of researches involving human. Signed informed consent was obtained from each participant and data were kept confidentially.

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