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Risk factors associated with the development of coronary artery disease in the middle age group

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Abstract

Background: Acute coronary syndrome includes Unstable Angina and evolving Myocardial Infarction which is usually divided into ST-segment elevation Myocardial Infarction (ST-SEMI) and non- ST-segment elevation (non- ST-SEMI) or new onset Left Bundle Branch Block.

Aim of the study: To assess the association between traditional risk factors and the development of cardiovascular diseases.

Methods: A cross-sectional study, was conducted during the period from the 1st of January 2022 to the 1st of May 2023 at Alrusafa Directorate of Health /AL Kindy Teaching Hospital and Ibn Al-Nafees Hospital

Results: The smoker patients were 48.5%, whereas 44.5% were overweight, and 18.5% of them were obese. 57.0% had hypertension, 41% had diabetes mellitus, and 41.5% had hyperlipidemia. The patients with ST-SEMI are (65.5%), while 15.5% of them had non- ST-SEMI. No significant association was obtained between the sociodemographic history and the type of ACS.

Conclusion: Hypertension was the commonest prevalent disease among the patients followed by diabetes mellitus. A family history of the acute coronary syndrome is significantly associated with the type of acute coronary syndrome.

Keywords: Risk factors; Acute Coronary Syndrome; ST elevation Myocardial infarction; Non-ST elevation Myocardial infarction

1. Introduction

Cardiovascular Diseases (CVD), including Acute coronary syndrome (ACS), have been the cause of 17.9 million deaths in 2018, which approximately accounts for about 23% of deaths worldwide [1-2].

ACS includes Unstable Angina (UA) and evolving Myocardial Infarction (MI) which is usually divided into ST-SEMI, and non- ST STEMI. or new onset Left Bundle Branch Block (LBBB)**[2, 3]** .

The death from coronary artery disease in Iraq reached about 18.5% of total deaths, it is mainly presented as either chronic stable angina or ACS[4]. In 2019, another study was done in Iraq revealed that CAD is the primary cause of hospitalizations and accounts for 33% of total deaths [5].

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One of the most significant developments in the understanding of coronary artery disease is a growing appreciation of the critical role that risk factors play in the onset of the disease [6]. According to the European Guidelines on cardiovascular disease prevention in clinical practice, risk factors are divided into individual factors, physiological and biochemical factors, and lifestyle [7].

The American Heart Association/American College of Cardiology (AHA/ACC) guidelines continue to emphasize the importance of primary prevention of ACS by decreasing coronary artery disease risk factors, including hypertension, hypercholesterolemia, diabetes mellitus, and smoking[8](39). Therefore this study aimed to assess the association between the traditional risk factors and the development of CAD and to estimate the prevalence of risk factors among middle-aged patients with CAD.

2. Material and methods

A cross-sectional study was conducted during the period from the 1st of January 2022 to the 1st of May 2023 at Alrusafa Directorate of Health /AL Kindy Teaching Hospital and Ibn Al-Nafees Hospital included 200 Middle-aged patients, those ages between 40-59 years[9](57).

The data was collected through direct interview, examination, and collection of the laboratory results using a questionnaire prepared by the researcher after a review of many similar articles. Sociodemographic characteristics, including age, gender, employment, educational level, smoking state, medical history including hypertension, diabetes, dyslipidemia (the patients who receive drugs for dyslipidemia), family history of premature coronary heart disease, and drug history were collected.

2.1. Statistical Analysis

Microsoft EXCEL 2019 and Statistical Package for the Social Sciences (SPSS), version 24 were used for data entry and analysis. The descriptive analysis focused on frequencies and percentages. Continuous variables were presented as mean (± Standard Deviation (SD)). The Chi-square test was used to estimate the statistical difference in proportions between different groups. A P-value of less than 0.05 was considered statistically significant.

3. Results

The sociodemographic distribution of the patients was shown in table (1).

Table 1 Sociodemographic distribution of the patients

Sociodemographic characteristic		**N**	**%**
Gender	Male	153	76.5
	Female	47	23.5
Age group (years)	40-49	36	18.0
	50-59	164	82.0
Education	Illiterate	58	29.0
	Primary school	60	30.0
	Secondary school	60	30.0
	College or higher	22	11.0
Employment	Employer	126	63.0
	Not employer	74	37.0
Smoking	Yes	97	48.5
	No	103	51.5

Regarding the BMI, 44.5% of the participants were overweight, while 18.5% of them were obese. As shown in figure 1.

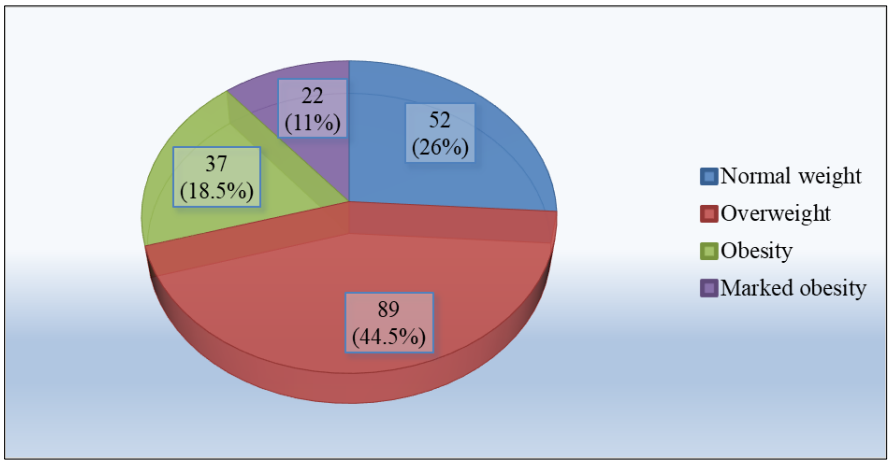

Figure 1 The BMI distribution of the patients

More half of the patients had hypertension (57.0%), 41% of them had diabetes mellitus, and 41.5% had hyperlipidemia (Table 2)

Table 2 Medical history of the patients

Medical history	N	%
Hypertension	114	57.0
Diabetes mellitus	82	41.0
Hyperlipidemia	83	41.5
Family history	60	30.0

*Some patients had more than one disease

More than half of the patients had STEMI (65.5%), while 15.5% of them had non STEMI (Figure 2).

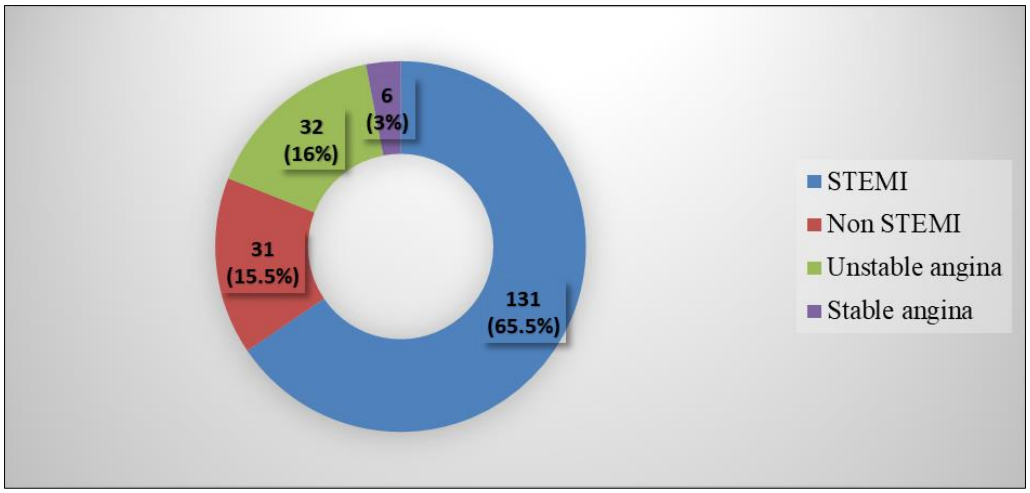

Figure 2 Distribution of the participants according to the diagnosis

No significant association was obtained between the sociodemographic history and the type of ACS, as shown in table 3.

Table 3 Association between the sociodemographic history and the type of ACS

Sociodemographic history		STEMI N (%)	Non STEMI N (%)	Unstable angina N (%)	Stable angina N (%)	P-value
Age group	40-49	22 (16.8)	8 (25.8)	5 (15.6)	1 (16.7)	0.673
	50-59	109 (83.2)	23 (74.2)	27 (84.4)	5 (83.3)	
Gender	Male	104 (79.4)	24 (77.4)	20 (62.5)	5 (83.3)	0.234
	Female	27 (20.6)	7 (22.6)	12 (37.5)	1 (16.7)	
Education	Illiterate	39 (29.8)	10(32.3)	8 (25.0)	1 (16.7)	0.178
	Primary school	39 (29.8)	10(32.3)	9 (28.1)	2 (33.3)	
	Secondary school	41 (31.2)	7 (22.6)	12 (37.5)	0 (0.0)	
	College or higher	12 (9.2)	4 (12.9)	3 (9.4)	3 (50.0)	
Employment	Employer	81 (61.8)	18 (58.1)	23 (71.9)	4 (66.7)	0.678
	Not Employer	50 (38.2)	13 (41.9)	9 (28.1)	2 (33.3)	
Smoking	Yes	64 (48.9)	13 (41.9)	17 (53.1)	3 (50.0)	0.844
	No	67 (51.1)	18 (58.1)	15 (46.9)	3 (50.0)	

There was a significant association was obtained between the family history of premature heart disease and the type of ACS, the higher percentage of patients with a family history was among those with unstable angina, as shown in table 4.

Table 4 Association between the medical history and the type of ACS

Medical history		STEMI N (%)	Non STEMI N (%)	Unstable angina N (%)	Stable angina N (%)	P-value
Hypertension	Yes	69 (52.7)	21 (67.7)	22 (68.8)	2 (33.3)	0.131
	No	62 (47.3)	10 (32.3)	10 (31.3)	4 (66.7)	
Diabetes mellitus	Yes	70 (53.4)	12 (38.7)	15 (46.9)	1 (16.7)	0.178
	No	61 (46.6)	19 (61.3)	17 (53.1)	5 (83.3)	
Hyperlipidemia	Yes	50 (38.2)	15 (48.4)	16 (50.0)	2 (33.3)	0.508
	No	81 (61.8)	16 (51.6)	16 (50.0)	4 (66.7)	
Family history	Yes	37 (28.2)	5 (16.1)	16 (50.0)	2 (33.3)	0.029
	No	94 (71.8)	26 (83.9)	16 (50.0)	4 (66.7)	

No significant association was obtained between the body mass index and the type of ACS, as shown in table 5.

Table 5 Association between the body mass index history and the type of ACS

Body mass index	STEMI N (%)	Non STEMI N (%)	Unstable angina N (%)	Stable angina N (%)	P-value
Normal weight	37 (28.2)	9 (29.0)	6 (18.8)	0 (0.0)	0.179
Overweight	60 (45.8)	15 (48.4)	11 (34.4)	3 (50.0)	
Obesity	19 (14.5)	5 (16.1)	10 (31.3)	3 (50.0)	
Marked obesity	15 (11.5)	2 (6.5)	5 (15.6)	0 (0.0)	

4. Discussion

The first finding of the current study was that 76.5% of the patients were male with no significant difference between the ACS types regarding gender distribution.

In comparison, another study that was done in Pakistan by Altaf et al.[10] revealed that among a total of 386 patients who were admitted with diagnoses of ACS, 210 (54.4%) were males and 176 (45.6%) were females. In agreement, Emad et al.[11] concluded that only 12.5 % of patients with ACS who had an age of ≤ 50 years were female.

In the current study, the employer and those with primary or secondary education constituted the largest percentage of the sample. In comparison, another study that included data from 3874 consecutive patients diagnosed with ACS admitted to 29 hospitals in four Arabian Gulf countries from January 2012 to January 2013 concluded that education was associated with lower stroke/transient ischaemic attack, MI, and all-cause mortality and readmissions for cardiac reasons and recommended that interventions promoting healthy lifestyles and management of clinical risk factors for patients with low health literacy are urgently required[12].

Regarding smoking, nearly half of the patients were smokers, but smoking insignificantly affects the type of ACS. In comparison, another study that was done in Qatar revealed that 67.3% of patients with an age ≤ 50 years and 48.1% of those aged 51-70 years were smokers[11] . In agreement with these results, revealed that smoking was a significant risk factor for the development of ACS[9]. In addition, Arantes et al. [13]concluded a different profile risk in younger individuals, in which smoking was the main modifiable cardiovascular risk factor.

Most of the patients in the current study were overweight, obese, or markedly obese with no significant difference between different types of ACS regarding the grades of obesity. In another study that was done by Aram in the Region of Kurdistan, Iraq, about 42% were overweight and 44% were obese[14]. The current study revealed that STEMI followed by unstable angina were the commonest prevalent types of ACS. In comparison, another study that was done in Qatar revealed that STEMI followed by NON-STEMI were the commonest types of ACS[11].

In the current study, hypertension was presented in more than half of the patients, while diabetes mellitus and hyperlipidemia were presented in about one-third of them. In addition, there was no significant difference between the ACS types regarding hypertension, diabetes mellitus, and hyperlipidemia. In comparison, the prevalence of hypertension, diabetes mellitus, and hyperlipidemia in young patients with ACS were 20%, 15%, and 57%, respectively as revealed in another study that was done by Yagel et al. [15]. In concordance, Arantes et al.[13] concluded that dyslipidemia was a significant risk factor for ACS in the young population. In Malaysia, a study was done there by Hoo et al. [16] revealed that the prevalence of hypertension, diabetes mellitus, and dyslipidemia among young patients with ACS were 51.4%, 37.8%, and 16.2, respectively.

Family history of ACS was presented in about one-third of the patients and significantly affected the types of ACS as it was more commonly presented in those with stable angina and unstable angina than in other types.

In another study that was done in Sweden, family history was presented in 8.2% of young patients with ACS [17].

5. Conclusion

Hypertension was the commonest prevalent disease among the patients followed by diabetes mellitus. A family history of the acute coronary syndrome is significantly associated with the type of acute coronary syndrome.

Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

There are no conflicts of interest.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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