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STUDY OF RISK FACTORS FOR ACUTE CORONARY SYNDROME IN YOUNG PEOPLE

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ABSTRACT

Background: Acute coronary syndrome is a condition in which there is a lack of blood supply and oxygen to the heart muscle, due to blockage or narrowing of the coronary arteries, which leads to a mismatch between the supply and demand of oxygen. Acute coronary syndrome (ACS) refers to a group of conditions that include ST-elevation myocardial infarction (STEMI), non-ST elevation myocardial infarction (NSTEMI), and unstable angina. It is a type of coronary heart disease (CHD), which is responsible for one-third of total deaths in people older than 35. **Research Materials and Methods:** A retrospective cohort study (COHORT) was conducted On a random group of patients from January 2018 to January 2023. The research approval (CV 8093) was given by the Ethics Committee of the Faculty of Medicine, Damascus University, Syria. **Results:** The sample included 250 patients, of which 20 were excluded, leaving us with 230 cases on which research and statistics were conducted. 19.1% were females and 80.9% were males. Participants are classified into three groups, with the age group (36 – 40) years representing the majority 71.7%. Patients with coronary disease were divided into 3 categories according to the disease type. Research and statistics showed that 60.9% of them presented with unstable angina. The results showed that the largest percentage of patients suffering from unstable angina were from the age group 36-40 years, at a rate of 63.6%, and the relationship was statistically significant (p-value=0.01). **Conclusion:** It is necessary to hold medical seminars on coronary heart disease and explain the difference between its types.

KEYWORDS: Acute coronary syndrome, unstable angina, coronary heart disease.

BACKGROUND

Acute coronary syndrome is a condition in which there is a lack of blood supply and oxygen to the heart muscle, due to blockage or narrowing of the coronary arteries, which leads to a mismatch between the supply and demand of oxygen. Atherosclerosis is also considered the main cause of acute coronary syndrome, almost always. It is also the leading cause of death in the United States and around the world.[1]

Acute coronary syndrome (ACS) refers to a group of conditions that include ST-elevation myocardial infarction (STEMI), non-ST elevation myocardial infarction (NSTEMI), and unstable angina. It is a type of coronary heart disease (CHD), which is responsible for one-third of total deaths in people older than 35. Some forms of CHD can be asymptomatic, but ACS is always symptomatic.[2-4]

ACS is a manifestation of CHD (coronary heart disease) and is usually a result of plaque disruption in coronary arteries (atherosclerosis). The common risk factors for the disease are smoking, hypertension, diabetes, hyperlipidemia, male sex, physical inactivity, family obesity, and poor nutritional practices. Cocaine abuse can also lead to vasospasm. A family history of early myocardial infarction (55 years of age) is also a high-risk factor.[5-7]

The classic symptom of ACS is substernal chest pain, often described as a crushing or pressure-like feeling, radiating to the jaw and/or left arm. This classic presentation is not seen always, and the presenting complaint can be very vague and subtle with chief complaints often being difficulty breathing, lightheadedness, isolated jaw or left arm pain, nausea, epigastric pain, diaphoresis, and weakness. So, The first step of evaluation is an ECG, which helps differentiate between STEMI and NSTEMI unstable angina.[8-10]

Finally, The initial treatment for all ACS includes aspirin (300 mg) heparin bolus, and intravenous (IV) heparin infusion if there are no contraindications to the same. Antiplatelet therapy with ticagrelor or clopidogrel is also

recommended. The choice depends on the local cardiologist's preference. Ticagrelor is not given to the patients receiving thrombolysis.[11-13]

RESEARCH MATERIALS AND METHODS
Study design, setting, and participants
A retrospective cohort study (COHORT) was conducted On a random group of patients from January 2018 to January 2023. The research approval (CV 8093) was given by the Ethics Committee of the Faculty of Medicine, Damascus University, Syria.

A paper questionnaire was conducted based on a review of patient files in the cardiac department at Damascus Hospital. Accordingly, the questionnaire was filled out and the data was reviewed under the supervision of the research supervisor.

The final sample size was 250 participants depending on the Raosoft site[14], with a confidence interval of 95%. Every participant has signed the informed consent.

Inclusion criteria
- The sample included patients who had coronary disease and from the age group 20-40 years.

Exclusion criteria
- patients without coronary disease were excluded.
- Patients outside the specified age range were excluded.

Ethics approval and consent to participate
Ethical approval was obtained from the Ethical Committee of the Syrian Private University, the necessary approval was provided to Damascus Hospital, and permission was obtained from the hospital to review patients' files.

Statistical Analysis
We used Excel 2010, and the Statistical Package for the Social Sciences version 26.0 (SPSS Inc., Chicago, IL, United States). P value < 0.05 was considered statistically significant. We relied on frequency, percentages, and graphs for categorical variables, meanwhile, for continuous variables, standard deviation, range, and median were used. For the statistical relationships, we used the Chi-square test (X2-test).

Descriptive statistics consists of studying the data of the study variables and studying some statistics such as the arithmetic mean, median, and standard deviation.

RESULTS
1-Socio-demographic data
The sample included 250 patients, of which 20 were excluded, leaving us with 230 cases on which research and statistics were conducted. 19.1% were females and 80.9% were males. Participants are classified into three groups, with the age group (36 – 40) years representing the majority 71.7%.

As for the nature of the participants' work. The sample was divided into two categories, the largest of which were patients who had a physical work nature with a percentage of 70.9% of our total sample.

We also divided the sample into two groups according to place of residence (city and countryside), and we found that the percentage of city residents was 42.2%.

Regarding the distribution of the sample according to habits, 79.1% were smokers and 20.9% were non-smokers. We also studied the distribution of the sample according to the amount of cigarette smoking per year, We found that a majority of 88.5% smoked less than 50 packets per year.

While consuming alcohol, a majority of 90.9% were non-alcoholic and only 9.1% of the patients often consumed alcohol.

More detailed demographic data is shown in (Table-1)

Table 1: Socio-demographic data.

	n	%
SEX		
Male	186	80.9%
Female	44	19.1%
AGE		
20 – 30	26	11.3%
31 – 35	39	17%
36 – 40	165	71.7%
Work nature		
Physical	163	70.9%
Office	67	29.1%
Residence		
Countryside	133	57.8%
City	97	42.2%
Smoking		
Non – smoker	48	20.9%
Smoker	182	79.1%
Packets smoked (per year)		
Less than 50	161	88.5%
50 – 100	21	11.5%
Total	182	100%
Alcohol consumption		
Non - alcoholic	209	90.9%
Alcoholic	21	9.1%

2- Sample distribution according to the coronary disease data
Coronary disease type
Patients with coronary disease were divided into 3 categories according to their type. Research and statistics showed that 60.9% of them presented with unstable angina.

Diagnostic method
When asked about the method of diagnosis, research, and statistics showed that all patients underwent a detailed clinical examination with radiological or laboratory investigations to confirm the diagnosis according to each case individually.

The presence of cardiovascular disease in patients
62.6% of patients had no history of cardiovascular disease when diagnosed with current CHD.

The type of cardiovascular disease
53.5% of patients suffered from acute coronary syndrome.

Medication and Treatment history of patients
Anticoagulants were the most used for treatment, at a rate of 98.8%.

More detailed information about the coronary disease data in the patient's sample is shown in (Table-2)

Table 2: coronary disease data in the patient's sample.

	n	%
Coronary disease type		
NSTEMI	20	8.7%
STEMI	70	30.4%
Unstable angina	120	60.9%
Diagnostic method		
Clinical examination	230	100%
Electromyography	230	100%
Ultrasound (Eco)	215	93.5%
Laboratory tests	179	77.8%
Cardiac catheterization	73	31.7%
Chest X-ray	41	17.8%
Cardiovascular disease history		
Yes	86	37.4%
No	144	62.6%
Type of cardiovascular disease		
ACS	46	53.5%
CAD	9	10.5%
DVT	3	3.5%
IHD	26	30.2%
CVA	4	4.6%
Artificial valve replacement	5	5.8%
Heart failure	3	3.5%
Total	86	100%
Medication history		
Anticoagulants	85	98.8%
Statins	50	58.1%
Painkillers	6	7%
Antihypertensives (ACEi)	12	13.9%
Antihypertensives (beta B)	25	29.1%
PPi	3	3.5%
Antihypertensives (CCBs)	4	4.6%
Antidiuretics	5	5.8%
Total	86	100%

3- Sample distribution according to the family history
The largest percentage of the patients 71.3% didn't have any family history of heart disease.

According to deaths due to heart attack, 90.9%, death was not due to a heart attack.

(Table-3) shows detailed information about the distribution of the sample according to the family history.

Table 3: Surgical procedure and post-operation data.

	n	%
Family history of heart diseases		
Neurosurgery	66	28.7%
Thoracic	164	71.3%
Death due to a heart attack		
Yes	21	9.1%
No	209	90.9%

We studied the distribution of a group of diseases among the sample members and found that hypertension was the most common disease, as shown in (Table-4)

Table 4: distribution of diseases among the sample members.

Disease	Yes (n)	Yes (%)	No (n)	No (%)	p-value
hypertension	71	30.9%	159	69.1%	
Diabetes type 1	1	0.4%	229	99.6%	
Diabetes type 2	25	10.9%	205	89.1%	
High blood lipids	5	2.2%	225	97.8%	
Immune diseases	7	3%	223	97%	0.043
COVID-19	3	1.3%	227	98.7%	
Chronic bronchitis	0	0%	0	0%	
Hypothyroidism	8	3.5%	222	96.5%	
Blood diseases	1	0.4%	229	99.5%	

4- Statistical relationships
Relationship between coronary disease and age
The results showed (Table-5) that the largest percentage of patients suffering from unstable angina were from the age group 36-40 years, at a rate of 63.6%, and the relationship was statistically significant (p-value=0.01).

Table 5: relationship between coronary disease and age.

	20 – 30 (n)	20 – 30 (%)	31 – 35 (n)	31 – 35 (%)	36 – 40 (n)	36 – 40 (%)	p-value
NSTEMI	2	7.7%	3	7.7%	15	9.1%	
STEMI	9	34.6%	16	41%	45	27.3%	0.01
UA	15	57.7%	20	51.3%	105	63.6%	
Total	26	100%	39	100%	165	100%	

Relationship between coronary disease and sex
The results showed (Table-6) that the largest percentage of patients suffering from unstable angina was female 77.3% and the relationship was statistically significant (p-value=0.01).

Table 6: relationship between coronary disease and sex.

	Male (n)	Male (%)	Female (n)	Female (%)	p-value
NSTEMI	16	8.6%	4	9.1%	
STEMI	64	34.4%	6	13.6%	0.01
UA	106	57%	34	77.3%	
Total	186	100%	44	100%	

Relationship between coronary disease and smoking
The largest percentage of patients were non-smokers and suffered from ACS, at a rate of 77.08%, and the relationship was statistically significant (p-value=0.005), as (Table-7) shows.

Table 7: relationship between coronary disease and smoking.

	Non-smoker (n)	Non-smoker (%)	Smoker (n)	Smoker (%)	p-value
NSTEMI	4	8.33%	16	8.79%	
STEMI	7	14.58%	63	34.62%	0.005
UA	37	77.08%	103	56.59%	
Total	48	100%	182	100%	

Relationship between coronary disease and family history
The results showed that the largest percentage of patients suffering from unstable angina with a positive family history 63.64%, and the relationship was statistically significant (p-value=0.001), as (Table-8) shows.

Table 8: relationship between coronary disease and family history.

	No family history (n)	No family history (%)	Family history (n)	Family history (%)	p-value
NSTEMI	15	9.1%	5	7.58%	
STEMI	51	31.1%	19	28.79%	0.001
UA	98	59.76%	42	63.64%	
Total	164	100%	66	100%	

Relationship between coronary disease and death

The results showed that the largest percentage of patients suffering from unstable angina with positive family history 63.64%, and the relationship was statistically significant (p-value=0.001), as (Table-9) shows.

Table 9: relationship between coronary disease and death.

	No (n)	No (%)	At a young age (n)	At young age (%)	At a late age (n)	At a late age (%)	p-value
NSTEMI	18	7.8%	1	0.4%	1	0.4%	
STEMI	62	26.9%	4	1.7%	4	1.7%	0.001
UA	129	56.1%	7	3%	4	1.7%	

Relationship between coronary disease and work nature

the largest percentage of patients suffering from unstable angina 41.7% with office work, and the relationships were statistically significant (P-VALUE = 0.05) (Table-10)

Table 10: relationship between coronary disease and work nature.

	Physic (n)	Physic (%)	Office (n)	Office (%)	p-value
NSTEMI	16	7%	4	1.7%	
STEMI	51	22.2%	19	6.3%	0.05
UA	96	41.7%	44	19.1%	

Relationship between coronary disease and residency

The largest percentage of patients had suffered from unstable angina and were Countryside residents, but the relationship was not statistically significant (P-VALUE = 0.10) (Table-11).

Table 11: relationship between coronary disease and residency.

	City (n)	City (%)	Countryside (n)	Countryside (%)	p-value
NSTEMI	6	2.6%	14	6.1%	
STEMI	28	12.2%	42	18.3%	0.10
UA	63	27.4%	77	33.5%	

DISCUSSION

The study included 230 samples, and compared with two globally published studies[15][16] (Table-12), we found that the majority of the patients were from the 36 – 40 age group and were male, and this is consistent with the two previously mentioned studies.

Also, our study is similar and consistent with the previous two researches, including that nearly 30% had a positive family history.

As for the smoking habit, in our study and the ESTEBAN study, the majority were smokers 79.1%, while in the CHEEMA study only 41.9% were smokers Regarding the Most common coronary heart disease, in our study and the CHEEMA study[15], UA was the Most common coronary heart disease, on the other hand in the ESTEBAN study[16], STEMI was the most common.

In the end, the three studies did not agree on the percentage of patients who had hypertension, as it was 36.1% in our research, in CHEEMA's research 46.3%, and in ESTEBAN's research 26%. Also, regarding the incidence of diabetes, it was in ours in 20% of the patients, 31.33% in CHEEMA's study, and 14.6% in ESTEBAN's study.

Table 12: comparison between our study, CHEEMA study, and ESTEBAN study.

	Our study	CHEEMA study	ESTEBAN study
Age	36 – 40	25 – 40	17 – 40
Sex	Male	Male	Male
Smoking	79.1%	41.9%	74.8%
Positive family history	28.7%	32.7%	30.2%
Diabetes	20%	31.33%	14.6%
Hypertension	36.1%	46.3%	26%
The most common coronary heart disease	UA	UA	STEMI

Limitations
- A large number of files and the lack of sufficient information for study hindered the process of collecting cases
- There are difficulties in accessing some files of patients admitted to cardiac care
- Some files do not include complete clinical tests, which created difficulty in selecting the files included.

CONCLUSION
It is necessary to hold medical seminars on coronary heart disease and explain the difference between its types, as well as publish awareness campaigns on the necessity of educating medical staff, especially students, doctors, and nurses, about the psychological consequences of coronary heart disease and ways to deal with them.

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