Assessment of Risk factors For myocardial Infraction in Sample of Patients Attending in Coronary Care Unit Ward in AL-Zahra hospital-Karbala City

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Abstract

The objective of the present study is to determine the rate of myocardial infarction among sample patients attending in CCU medical ward in AL-Zahra hospital and to identify factors associated with the myocardial infarction (age, gender, residence, occupation and educational level), Family history (hypertension…..etc. A case control study conducted in Karbala city / AL-Zahra hospital /medical ward /CCU for cardio pulmonary care unit.. Sampling was (non probability convenient) the study was included 100 cases and 100 controls.. The study was started from 15th July 2015 to the 20th October 2015. Data was collected by questionnaire to obtain socio- demo graphic information. The result shows that mean age of the subjects was 49.02± 8.3 years, and the 23.5% were Free profession ; about (24.5%) of patient with myocardial infarction were smokers. Analyses of results by (chi-square test) show that (unemployment, low educational level, Family history for hypertension, overweight, chronic diseases: there is a high significant association between hypertension and myocardial infarction, smoking and lipid profile) were significant factors associated with myocardial in fraction . Conclusions This study showed the rate of myocardial infraction was 12.5 % among age group (51-60) year, factors that were associated with higher rate of myocardial infraction were unemployment, low educational level, Family history for hypertension, overweight and chronic diseases: there is a high significant association between hypertension and myocardial infarction, smoking and lipid profile.

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Key words: Myocardial, Infraction , Factors, Karbala

Introduction

Myocardial infarction (MI) or a cute myocardial infarction (AMI), commonly known as heart attack, occurs when blood flow stops to a part of the heart causing damage to the heart muscle. The most common symptom is chest pain or discomfort, which may travel into the shoulder, arm, back, neck, or jaw. Often it's in the center or left side of the chest and lasts for more than a few minutes. The discomfort may occasionally feel like heart burn. Other symptoms may include shortness, nausea, feeling faint, a cold, or feeling tired[1]. About 30% of people have atypical symptoms, [2]with women more likely than men to present atypically. In Iraq the risk of death in those who have had an Segment Elevation Myocardial infarction is about 10%. Rates of myocardial infarction for a given age have decreased globally between 1990 and 2010. About one million people have an myocardial infarction each year in the United States. . Among those over 75 years old, about 5% have had an myocardial infarction with little or no history of symptoms. A myocardial infarction may cause heart failure, an irregular heart beat, or cardiac arrest.[2]

Most MIs occur due to disease. Risk factors include high blood pressure, smoking, diabetes, lack of e exercise, obesity, high blood cholesterol, poor diet, and excessive alcohol in take, among others. The mechanism of an MI often involves the rupture of an atherosclerotic plaque, leading to complete blockage of a coronary .MIs are less commonly caused by coronary, which may be due to cocaine, significant emotional stress, and extreme cold, among others. A number of tests are useful to help with diagnosis, including electrocardiograms , blood tests, and coronary [3]. Aspirin is an appropriate immediate treatment for a suspected myocardial infarction. Supple mental oxygen should be used in those with low oxygen levels or shortness of breath . People who have a non-ST elevation myocardial infarction are often managed with the blood thinner , with the additional use angioplasty in those at high risk [4]. In people with blockages of multiple coronary arteries and diabetes, by pass surgery (Coronary Artery Bypass Grafting) maybe recommended rather than angioplasty. After an myocardial infarction, life style modifications, along with long-term treatment with aspirin, beta-blockers, and stating, are typically recommended [5] . The aim of this study is to determine the rate of myocardial infarction among patients attending in CCU medical ward in AL-Zahraa hospital & to identify factors associated with the myocardial infarction MI (age, gender, residence, occupation and educational level), Family history (hypertension) .

Methods

A case control study design was used. The study was conducted in Karbala city / AL-Zahra hospital /medical ward /CCU for cardiopulmonary care unit.The patients were selected (none probability convenient sampling), Subjects in this study included all patient (cases) of myocardial infarction admitted to the AL-Zahraa hospital /medical ward /CCU for cardiopulmonary care unit and their control. Study included 100 cases and 100 controls. The study has started from 15th July 2015 to the 20th October 2015. The data were collected by direct interview using special questionnaire .Information were included socio-demographic data (age, education and occupation), Family history (hypertension, diabetes mellitus) , Body Mass Index, Smoking behavior, lipid profile, ……..ect

Criteria for the selections of cases and controls

1) Inclusion criteria for cases :

-The entire patients who were diagnosed by the electrocardiograph, serum troponin, clinical signs & symptoms (sever chest pain, sweating, vomiting and dyspnea) as myocardial infarction.

- All age groups and both gender.
For Controls -Age, gender are matched.
-Do not have myocardial infarction and other type of heart diseases.
2) Exclusion criteria for cases:
- Patient who live outside Karbala.
Cigarette – smoking : consists of three groups : (a) non – smoker (did not smoke through out the pregnancy) ; (b) smoker ; (c) and passive smoker (had a house hold member who smoked ten cigarettes per day) [6].

Lipid profile can be divided into [7] **:**

	Normal value
Low Density Lipoprotein	60 to 130 mg/ dl
High Density Lipoprotein	Greater than 40 mg/ dl
Cholesterol	Less than 200 mg/ dl
Triglycerides	10 to 150 mg/ dl

Statistical analysis: data was analyzed by SPSS package version 18, X^2 test was used for significance of association (p – value of < 0. 05 was considered significant) .

Results

Table (1) shows that higher parentage (12.5%) of patients was in the age group (51-60) years, and the higher percentage (12.5%) of control was in the age group (41-50) years. The total number of cases was (100, 50.0 %), the number of males was (69, 34.5 %) and the number of females was (31,15.5 %), while the total number of controls was (100, 50.0 %) the number of males was (66, 33.0 %) and the number of females also (34,17.0 %) were shown in table (2). Table (3) shows that higher percentage of cases that residence with urban is (70 , 35.0 %), and higher percentage of control that residence with urban is (71, 35.5 %), and higher percentage of occupation of the sample in this study was free profession (16.0 %) in s ample with myocardial infarction group and (1.5 %) in sample without myocardial infarction significant association (P-value <0.05) , the read and write rate was higher among the sample with myocardial infarction (4.5% vs. 15%) compared to control . The family history of patients with hypertension (26.5% vs. 23.5 %) compared to control show in table (4). Table (5) shows that body mass index of cases was higher among sample with overweight (23.5% vs. 21.5 %) compared to control. The chronic disease of hypertension higher among sample with myocardial infarction (26.5 %) while in controls was (18.5). The percentage of cases with DM among sample with myocardial infarction was (20.0%) While controls was (11.0%), The percentage of cases with kidney disease among sample with MI was (10.0%) While controls was (6.0%). The percentage of cases with thyrotoxicosis among sample with myocardial infarction was (3.5%), while controls was (4.2%) shown in table (6). Table (7) showed that association of myocardial infarction and smoking behavior in this study showed that the percentage of smoker was (24.5 %) in the people with myocardial infarction and about (36 %) in people without myocardial infarction the risk of myocardial infarction significantly increased (4.1874) times in the people with passive smokers. And the risk of myocardial infarction significantly increased (4.152) times in the people duration of smoking (30 -40) years, and increased (12.078) times in the people with number of cigarettes more than (60) per day. The association of MI and lipid profile in this study shows that the percentage of normal " High Density Lipoprotein " was (31.0 %) in the people with myocardial infarction and about (40 %) in people without MI the risk of MI significantly increased (0.352) times in the people with low " High Density Lipoprotein ". The risk of myocardial infarction significantly increased (1.5455) times in the people with higher" LDL" lipid profile, and the risk of myocardial infarction significantly increased (3.9516) times in the people with higher cholesterol, the risk of myocardial infarction significantly increased (1.444) times in the people with higher triglycerides were shown in table (8).

Discussion

Myocardial infarction, commonly known as a heart attack, is the irreversible necrosis of heart muscle secondary to prolonged ischemia. This usually results from an imbalance in oxygen supply and demand, which is most often caused by plaque rupture with thrombus formation in a coronary vessel, resulting in an acute reduction of blood supply to a portion of the myocardium. [8] . In this study, most of the patients in both study group belong to the age (51-60) years (12.5 %). The finding of the present study is agreement with finding reported in USA .[9] increasing prevalence of myocardial infarction with age the cases of myocardial infarction with age group (41-50) is ranging (17.28%), and the control age group (51-60)is ranging (22.43%) this may cause contrast in time and place of the studies [9] . This study showed that about (34.5%) of the studied group were males while the females were (15.5 %),the risk of males infecting with myocardial infarction was (1.14) more than females, ,similar finding is reported by the European Society of Cardiology [10]. Because supporting the aspect that women are protected from myocardial infraction due to the presence of cardio protective estrogens[11]. This study is the highest percentage of cases that residence with urban is (35.0%), and higher percentage of occupation among sample with free profession (16.0%), and the literacy status was higher among (12.5%),these result that occur have similar finding which is reported by India[11], the residence with urban is (37.45 %), occupation is middle socio- economic status was (17.6 %), and lower educational level was (46.33%). This may be explained contrast in time and place . Regarding family history of myocardial infarction was higher among patient with myocardial infarction (26.5%) compared to control group (23.5%) with significant is reported by in India [12] patients were (33.45 %), and in control were (9.55%), (95%,CI 2.99-7.89) (OR=4.75), a possible explanation for this may be due to the aggregation effect of heredity may originate from the here dietary transfer of hypercholesterolemia, hypertension and diabetes [13] . This study found association between overweight with p-value < 0.05 similar finding is reported by in Middle East and North Africa [14], a possible explanation for they may be due to weight increase is associated with bad lifestyle in both men and women. In this study, the percentage of cases with hypertension was (26.5 %), the risk of myocardial infarction of individual with hypertension is(1.92) more than individual without hypertension ,probably due to ventricular hypertrophy associated with high blood pressure [15]. In this study, the percentage of cases with diabetes mellitus was (20.0%), the risk of myocardial infarction of individual with diabetes mellitus is (2.3636) more than individual without diabetes mellitus, and this may be explained by diabetes mellitus damages blood vessels including the coronary arteries of the heart. In this study, the percentage of cases with kidney , disease was (10.0 %), the risk of myocardial infarction of individual with kidney disease is(1.833) more than individual without kidney disease, similar finding is reported by (south Africa) , [13] . This study, shows that the percentage of never smoker was (14.5 %) in the people with myocardial infarction and passive smoker about (11.0 %),and the people were smokers about (24.5%) the risk of myocardial infarction significantly increased (4.1874) times in the people with passive smokers. This is similar to study done by South Korea) [15] (40%) of the patients attempted smoking; (13.5%) of them passive smoking while (26%) of the patients overall had never smoking. From the multivariate logistic analysis including smoking patterns and clinical characteristics, the severity of coronary artery disease was the only in dependent predictor for smoking cessation (Relative risk (RR): 1.230; P = 0.022). This maybe because smoking increases the risk of an initial cardiac event and doubles the rate of subsequent infarction and death [16] .

This study shows the association of myocardial infarction and lipid profile in this study shows that the percentage of normal " High Density Lipoprotein " w ere (31.0 %) in the people with MI and about (40 %) in people without myocardial infarction the risk of myocardial infarction significantly increased (0.352) times in people with low " High Density Lipoprotein ", the risk of myocardial infarction significantly increased (1.5455) times in people with higher " Low Density Lipoprotein " lipid profile , and the risk of myocardial infarction significantly increased (3.9516) times in the people with higher cholesterol, the risk of myocardial infarction was significantly increased (1.444) times in people with higher triglycerides. This is similar to study done by South Korea[15] **,** may be explained by the higher level of blood cholesterol, the greater the risk of heart disease or heart attacks[16].

Conclusions

The results of the present study was indicated that rate of myocardial infarction was higher in male than female. Factors that were associated with myocardial infarction were Residence: in urban, unemployment, low educational level, family history for hypertension, overweight ,and chronic diseases: there is a high significant association between hypertension and myocardial infarction, smoking and lipid profile.

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Table (1): Distribution of age sample according to cases and controls

ge /years	Groups				Total	
	Case		Controls			
	NO.	%	NO.	%	NO.	%
21 – 30	5	2.5	20	10.0	25	12.5
31 – 40	17	8.5	22	11.0	39	19.5
41 – 50	23	11.5	25	12.5	48	24.0
51 – 60	25	12.5	19	9.5	44	22.0
61 – 70	22	11.0	8	4.0	30	15.0
>= 70	8	4.0'	6	3.0	14	7.0
Total	100	50.0	100	50.0	200	100.0

P-value "= 0.004 Significant "degree freedom" =5

Table (2): Distribution of gender according to cases and control.

Gender	Groups				Total		OR	95%CI	P-value
	Case		Controls						
	NO.	%	NO.	%	NO.	%			
Male	69	34.5	66	33.0	135	67.5	1.14	0.63–2.07	0.65 NS
Female	31	15.5	34	17.0	65	32.5			
Total	100	50.0	100	50.0	200	100.0			

Table (3): Distributions the demographic characteristics.

Demographic characteristics	**Cases**		**Controls**		**Total**		**P-value**
	NO.	**%**	NO.	%	NO	%	
Residence							
Urban	70	35.0	71	35.5	141	70.5	0.87
Rural	30	15.0	29	14.5	59	29.5	
Total	100	50.0	100	50.0	200	100	
Occupation							
Gov. employee	15	7.5	20	10.0	35	17.5	0.003*
Free profession	33	16.0	14	7.0	47	23.5	
Unemployed	10	5.0	17	8.5	27	13.5	
Retired	12	6.0	8	4.0	20	10.0	
Private sector employee	2	1.5	12	6.0	14	7.0	
Other	28	14.0	29	14.5	57	28.5	
Total	100	50.0	100	50.0	200	100	
Educational level							
Illiterate	14	7.0	3	1.5	17	8.5	0.000*
Read & write	25	12.5	6	3.0	31	15.5	
Primary	24	12.0	20	10.0	44	22.0	
Intermediate	10	5.0	13	6.5	23	11.5	
Secondary	18	9.0	28	14.0	46	23.0	
Higher education	9	4.5	30	15.0	39	19.5	
Total	100	50.0	100	50.0	200	100	

*** Statistically significant.**

Table (4): Distributions of the s ample according to family history.

Family history	**Cases**		**Controls**		**Total**		**Test**
	NO.	%	NO.	%	NO	%	
Hypertension							
Have H.T.	53	26.5	47	23.5	100	50.0	O.R.= 1.2716
Have not H.T.	47	23.5	53	26.5	100	50.0	(95%CI) =0.729 - 2.215
Total	100	50.0	100	50.0	200	100	P-value=0.396 NS
Heart disease							
Have H.D.	30	15.0	23	11.5	53	26.5	O.R.= 1.4348
Have not H.D.	70	35.0	77	38.5	147	73.5	(95%CI)=0.762 - 2.703
Total	100	50.0	100	50.0	200	100	P-value=0.262 NS
Diabetes mellitus							
Have D.M.	41	20.5	45	22.5	86	43.0	O.R.= 0.8493
Have not D.M.	59	29.5	55	27.5	114	57.0	(95%CI)=0.485 - 1.4875
Total	100	50.0	100	50.0	200	100	P-value=0.568 NS

Table (5): Distributions of population according to BMI.

BMI	Groups				Total	
	Case		Controls			
	NO.	%	NO.	%	NO	%
Under weight	1	.5	4	2.0	5	2.5
Normal weight	32	16.0	31	15.5	63	31.5
Over weight	47	23.5	43	21.5	90	4 5.0
Obese	20	10.0	22	11.0	42	21.0
Total	100	50.0	100	50.0	200	100.0

"P-value" = 0.002 S "df" =3

Table (6): Distributions of study population according to chronic diseases

Chronic diseases	**Cases**		**Controls**		**Total**		**Test**
	NO.	%	NO.	%	NO	%	
Hypertension							
Have H.T.	53	26.5	37	18.5	90	45.0	O.R.= 1.92
Have not H.T.	47	23.5	63	31.5	110	55.0	(95% C1)=1.0915 - 3.378
Total	100	50.0	100	50.0	200	100	P-Value= 0.02 S
Diabetes mellitus							
Have D.M.	40	20.0	22	11.0	62	31.0	O.R.= 2.3636
Have not D.M.	60	30.0	78	39.0	138	69.0	(95% C1)=1.272 - 4.392
Total	100	50.0	100	50.0	200	100	P-Value= 0.006 S
Kidney disease							
Have K.D.	20	10.0	12	6.0	32	16.0	O.R.= 1.833
Have not K.D.	80	40.0	88	44.0	168	84.0	(95% C1)=0.843- 3.988
Total	100	50.0	100	50.0	200	100	P-Value= 0.123 NS
Thyrotoxicosis							
Have thyro.	7	3.5	9	4.5	16	8.0	O.R.= 0.761
Have not thyro.	93	46.5	91	45.5	184	90.2	(95% C1) =0.272- 2.13
Total	100	50.0	100	50.0	200	100	P-Value= 0.602 NS

Table (7): Distribution of study population according to smoking behavior

Smoking Behavior	Cases		Controls		Total		Test	
	NO.	%	NO.	%	NO	%	O.R	(95%CI)
Smoking habit								
Passive smoker's	22	11.0	20	10.0	42	21.0	vvcfee	1.018 - 4.589
Smoker's	49	24.5	23	11.5	72	36.0	4.1874	2.148 - 8.161
Never smoker's	29	14.5	57	28.5	86	43.0	-	-
Total	100	50.0	100	50.0	200	100	-	-
Duration of smoking								
1-10 years	5	2.5	2	1.0	7	3.5	3.774	0.705-20.203
10-20 years	14	7.0	7	3.5	21	10.5	3.019	1.1403-7.996
20-30 years	11	5.5	4	2.0	15	7.5	4.152	1.253-13.755
30-40 years	15	7.5	8	4.0	23	11.5	2.8309	1.119-7.1619
More 40 years	4	2.0	2	1.0	6	3.0	3.019	0.5332-17.0991
NO smoking	51	25.5	77	38.5	128	64.0	-	-
Total	100	50.0	100	50.0	200	100.0	-	-
Number of cigarettes per day								
< 20 cpd	1	0.5	3	1.5	4	2.0	0.503	0.0509-4.9736
20-40 cpd	17	8.5	14	7.0	31	15.5	0.833	0.8312-4.0433
40-60 cpd	23	11.5	5	2.5	28	14.0	6.945	4.4799-19.4505
More 60 cpd	8	4.0	1	0.5	9	4.5	12.078	1.466-99.5056
No smoking	51	25.5	77	38.5	128	64.0	-	-
Total	100	50.0	100	50.0	200	100.0	-	-

Table (8): Distribution of study population according to lipid profile.

Lipid profile	Cases		Controls		Total		Test	
	NO.	%	NO.	%	NO	%	O.R	(95%CI)
HDL								
High	4	2.0	5	2.5	9	4.5	0.352	0.0829-1.502
Normal	62	31.0	80	40.0	142	71.0	0.3419	0.1711-0.6831
Low	34	17.0	15	7.5	49	24.5	-	-
Total	100	50.0	100	50.0	200	100.0	-	-
LDL								
High	34	17.0	22	11.0	56	28.0	1.5455	0.2062-11.7917
Normal	64	32.0	76	38.0	140	70.0	0.8421	0.1153-6.1481
Low	2	1.0	2	1.0	4	2.0	-	-
Total	100	50.0	100	50.0	200	100.0	-	-
Cholesterol								
High	28	14.0	31	15.5	59	29.5	3.1613	0.6056-16.5019
Normal	70	35.0	62	31.0	132	66.0	3.9516	0.7913-19.7344
Low	2	1.0	7	3.5	9	4.5	-	-
Total	100	50.0	100	50.0	200	100.0	-	-
Triglycerides								
High	39	19.5	36	18.0	75	37.5	1.444	0.3023-6.9013
Normal	58	29.0	60	30.0	118	59.0	1.2889	0.2764-6.0114
Low	3	1.5	4	2.0	7	3.5	-	-
Total	100	50.0	100	50.0	200	100.0	-	-