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STUDY OF SOME FACTORS AFFECTING IN MYOCARDIAL INFARCTION

Basim M. Ali [1], Furqan Moein [2], Maha Al-Andaleb [3], Zainab Hussein [4], Mansoor K. Abidali [5], Shaymaa Dhyaa [6]

[1]Lecturer, Department of Chemistry, College of Science, Kufa University, Iraq
E-mail: basimm.radhi@uokufa.edu.iq
[2]Lecturer, Department of Chemistry, College of Science, Kufa University, Iraq
E-mail: furqan.chmala@uokufa.edu.iq
[3]Lecturer, Department of Chemistry, College of Science, Kufa University, Iraq
[4]Bachelor, Department of Chemistry, College of Science, Kufa University, Iraq
[5]Bachelor, Department of Chemistry, College of Science, Kufa University, Iraq
[6]Bachelor, Department of Chemistry, College of Science, Kufa University, Iraq

ABSTRACT:
This study aims to determine the effect of some environmental and behavioral factors on heart disease, such as diabetes, smoking, the effect of body mass, and gender. Samples were collected from the Cardiology Center at Al-Sader Teaching Hospital in Al- Najaf Governorate in Iraq. Where 60 samples were collected (40 male and 20 female), all of them suffering from myocardial infarction, 41% of them suffering from diabetes and 26% without diabetes. On the other hand,23% of patients are smokers and 43% are non-smokers. The results showed no significant change in glucose and insulin levels among patients with myocardial infarction and the control group. On the other hand, the results showed a positive relationship between sugar concentration and insulin concentration, as well as a positive relationship between smoking and diabetes. It can be concluded that smokers are more likely to develop insulin resistance, which leads to type 2 diabetes, which increases the risk of myocardial infarction.
Keywords: Environmental and behavioral factors, myocardial infarction, insulin resistance, Type 2 diabetes

INTRODUCTION:

Myocardial infarction (MI), It is damage to the heart muscle resulting from little or no blood flow to the part of the heart, which leads to severe pain in the left part of the chest, pain in the shoulder and shortness of breath and may be accompanied by other symptoms such as nausea , sweating, fatigue, vomiting and heartburn . these symptoms may last for a few minutes [1] [2]., despite the many symptoms, chest pain is the most common symptom of myocardial infarction, the pain may extend to the left jaw and left shoulder [3].Symptoms usually appear in the early hours of the day between six in the morning until around noon. As for symptoms appearing in the evening, it is about three times less than in the morning[4]. Myocardial infarction is a risk indicator whose severity ranges from tachycardia to cardiac arrest [2].

The causative factors for heart disease, especially myocardial infarction, are aging and lifestyle, such as unhealthy diet, smoke , lack of exercise[5] [6].,In addition to the genetics factor, Where a previous study has proven that there are more than 27 genetics responsible for myocardial infarction[7], this disease, which is the cause of 40% of deaths in Western countries, [6].

Key Words: Myocardial infarction , Insulin , Body Mass Index.

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SUBJECTS AND METHODS

Subjects: Sixty Iraqi patients(40 male and 20 female) with Myocardial infarction were participated in the present study. There are ranged within 45-75 years old.41% of them suffering from diabetes and 26% without diabetes 23% of patients are smokers and 43% are non-smokers. on the other hand, Thirty apparently healthy subjects (15 male and 15 female) were selected as a control group. They are in the same range of patients age,4% of them with diabetic and 29 % without diabetic.13% are smoking ,and 17% are non-smoking.

Biochemical measurements: Samples were collected from patients suffering from myocardial infarction and then the sample was left to coagulate and then the serum was separated. The patient's weight and length were measured and then BMI was measured. Insulin was measured by ELISA while blood sugar was estimated by spectrophotometer.

Statistical analysis:- The results were expressed as (mean±standard deviation). Pooled t-test was used to compare between the patients and control groups according to the measured parameters , probability (p) value calculated using Microsoft Excell® 2010 program, considering a significant change when P Value < 0.05 [8]

RESULTS AND DISCUSSION

Table (1): The numbers and characteristics of patients and control group

The characteristics		Patients(%)	Control(%)	P value
Total (No.)		60(66.66)	30(33.33)	
Age (mean ± SD)		59.15 ± 9. 3	55.76 ± 8.7	0.0947
Sex	male	40(44)	15(17)	0.14
	female	20(22)	15(17)	
Smoke	Smoking	21(23)	13(15)	0.456
	Non	39(43)	17(19)	
DM	DM	37(41)	4(4)	6.80725E-07***
	Non	23(26)	26(29)	

Table (2):BMI , Blood Sugar, Insulin Levels in patients and in control group .

Parameters	Patients	Control	P Value
	Mean ± SD	Mean ± SD	
BMI	25.78 ± 2.6	25.0 ± 3.75	0.3167
B.Sugar	94.65 ± 16.19	94.3 ± 10.01	0.8999
Insulin	7.97 ± 8.85	15.06 ± 22.95	0.1123

The results in Table (1) indicate that there is no significant change between the patient group and control group in body mass index, glucose level and insulin, although 41% of them suffer from diabetes. When reviewing the medical history of these patients, The history of patients appear that they continued to take diabetes treatment. These results are consistent with another study[9]

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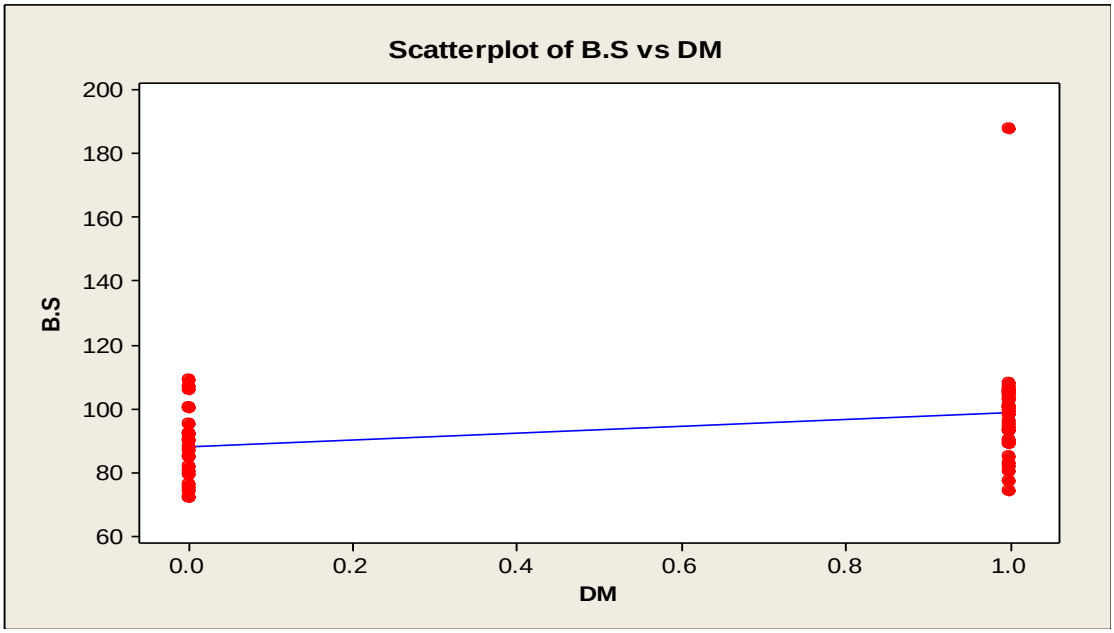

Figure (1) Correlation between Blood sugar and Diabetic in patients with myocardial infarction

The results in figure (1) refers to positive correlation between blood sugar and persons suffer from diabetic in MI patients. Insulin regulates the level of blood sugar in healthy people, Insulin resistance and metabolic disorder syndrome are problems that develop with age and eventually lead to type 2 diabetes. [10]

Monitoring of diabetes is very important because diabetics are more susceptible to myocardial infarction, as the previous study proved that diabetes increases the probability for formation clots and plaques that ultimately lead to myocardial infarction and that diabetic patients with myocardial infarction are more likely to die than non-diabetic patients[11].On the other hand, a previous study proved that smoking increases the probability of developing insulin resistance[12], and this is consistent with the results of the current study shown in figure(2) and (3).

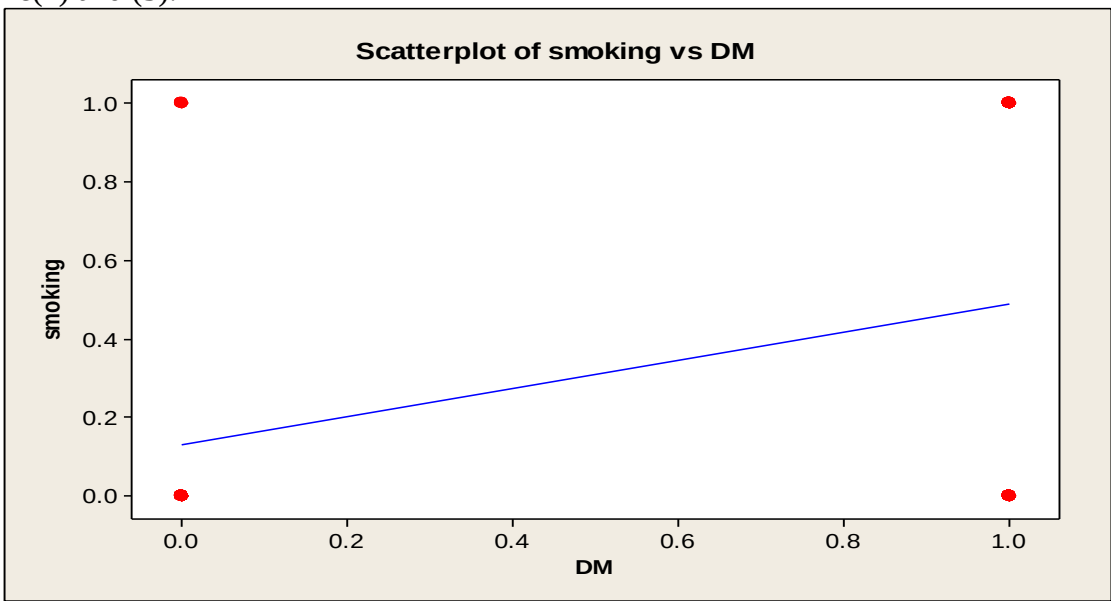

Figure (2) Correlation between Smoking and Diabetic in patients with myocardial infarction

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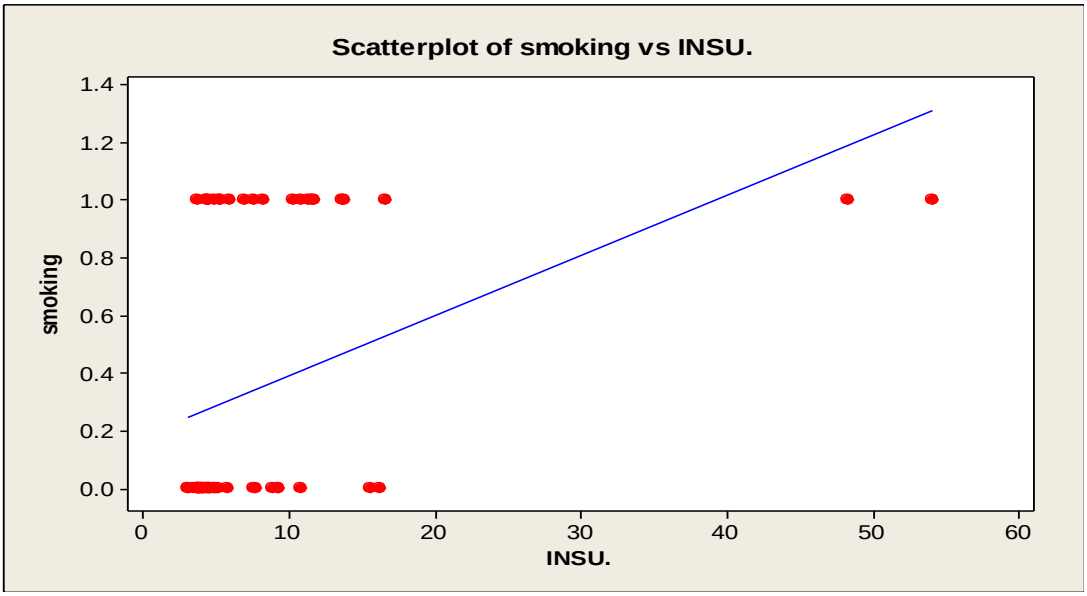

Figure (3) Correlation between Smoking and Insulin in patients with myocardial infarction

In addition to diabetes, there are other factors that negatively affect heart health, such as the effect of body mass , lifestyle, smoking and diet. Previously, many researchers have studied the effect of body mass on heart disease, They linked high weight with blood pressure, fat accumulation, and increased glucose, which affected heart health.[13[,[14],[15],[16]. While another researcher stated in a more recent study that high and low body mass affects heart health and may lead to heart disease[17], [18], [19]. Smoking is a major cause of heart disease, where the smoker is exposed to a lot of harmful substances that may cause clogging of the arteries, even in young people especially for women. [20]

On the other hand, smoking reduces nitric oxide levels by increasing oxidative stress factors (free radicals), which leads to endothelial dysfunction, this increases the risk of bleeding inside the heart muscle[21].

CONCLUSION

The current study proved that smokers are more likely to develop insulin resistance, which leads to type 2 diabetes, which increases the risk of myocardial infarction.

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