Assessment of the Risk Factors of Coronary Artery Diseases in Al-Nasiriyah City

تقييم عوامل الخطورة لأمراضِ الشرايين التاجيةِ في مدينةِ الناصرية

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المستخلص:
الهدف: تقييم عوامل خطر مرض الشرايين التاجية في مدينة الناصرية.
المنهجية : اختيرت عينة غرضيه تكونت من (١٠٠) مريض. وتألفت سكان الدراسة من عينة من البالغين من كلا الجنسين الذين كانت اعمارهم ٣٠ عاما وأكثر،وشخصوا حديثا بإصابتهم بمرض الشرايين التاجية بواسطة تصوير الأوعية التاجية في وحدة قسطرة القلب بمركز الناصرية للقلب.
النَتائِج: أظهرت نتيجة الدراسة أن عوامل الخطر الشائعة التي يتحكم بها هي انخفاض البروتين الدهني عالي الكثافة (٥٨٪)،التدخين (٥٣٪)، وارتفاع ضغط الدم (٤٦٪)، داء السكري(٣٤٪) ،السمنة (٣٠٪) ، وارتفاع الدهون الثلاثية (١٩٪)، ارتفاع الكولسترول (١٧٪)، وارتفاع البروتين الدهني منخفض الكثافة (١٤٪).كل هذه العوامل ترتبط ارتباطا وثيقا بالمرض .أما عوامل الخطورة الأخرى الشائعة و التي لا يتحكم بها هي العمر فوق سن الخمسين، الجنس والتاريخ العائلي لمرضى الشرايين التاجية.
التوصيات: استنادا إلى النتائج المذكورة أعلاه فإن هذه الدراسة توصي إلى تنظيم برامج تثقيفية تستهدف المرضى وأسرهم حول مرض الشرايين التاجية (عوامل الخطوررة وشدَّةَ المرضِ،كيف يُمْكِن للمريض أَنْ يُسيطرَ على نفسه لتَفادي المضاعفات)،ويمكن تحقيق هذا من خلال مؤسسة حكومية أو منظمة غير حكومية.

Abstract:
Objective: to assess the risk factors of coronary artery disease patients.
Methodology: A non-probability (purposive) sample of (100) patients. The study population consisted of a sample of adults from both genders whose ages were 30 years and more, and was newly diagnosed as having CAD by coronary angiography in the cardiac catheterization unit of An Nasiriyah heart center.
Results: The result of the study showed that the most common modifiable risk factors were low HDL-C levels (58%), smoking (53%), hypertension (46%), diabetes mellitus (34%), obesity (30%), high triglycerides (19%), hypercholesterolemia (17%), and high LDLC (14%). All these factors were positively and significantly associated with the development of CAD. Whereas, the most common non-modifiable risk factors were age 50 years and more, sex, family history of CAD
Recommendation: Based on the above results, this study recommends conducting educational programs targeting patients and their families about coronary artery disease (severity and risk factors of disease, who the patient can control himself to avoid complications), this can be achieved through government organization or non- government organization.
Keywords: Assessment; coronary artery disease; risk factors.

Introduction:

The heart disease has become a major killer of mankind. With the vast changes in the lifestyle of people, cardiac problems are increasing day by day in our country, also the cardiovascular disease are becoming a leading cause of morbidity and mortality among coronary vascular disease in the coronary artery disease has become the most important cause of pre matured death and disability in the population in some countries on death among three men around the age of 55 years is due to CAD [(1)].

Coronary heart disease is the single leading cause of death in the United States. Cardiovascular diseases are responsible for the lives of 41.4 % of more than 2.3 million Americans who die each year. Nearly 59 million Americans have some form of cardiovascular disease, ranging from congenital heart defects to high blood pressure and atherosclerosis [(2)].

Cardiovascular disease is the common cause of death. Some of the risk factors for heart disease include smoking, high blood pressure, high cholesterol, diabetes and obesity. Additional Heart Disease Risk Factors include lack of exercise, an unhealthy diet and stress. The major form of cardiovascular disease is coronary artery disease, manifested by myocardial disease, angina pectoris and sudden cardiac death [(3)].

Identifying risk factors is the first step in health promotion, wellness education and illness prevention activities. Risk factor modification, health promotion or illness prevention activities or any programmers that attempts to change unhealthy lifestyle behaviors can be considered a wellness strategy [(4)]. The objective of the study was to assess the risk factors of coronary artery disease in Al Nasiriyah city

Methodology:

A descriptive study was carried out. Data collection started from 24th of March to the 6th of May 2013.The study was conducted in the cardiac care unit and medical cardiac wards after the patient's diagnosis CAD by cardiac catheterization in the AL Hussein teaching hospital and An Nasiriyah heart center, in al Nasiriyah city, Thi-qar, Iraq.

Questionnaire**:**

The study instrument consisted of two major parts constructed for the purpose of the study. First, it is concerned with socio-demographic characteristic, which includes 8 variables (age, gender, and occupational status, level of education, marital status, monthly income, and residential area). The second part consists of the questionnaire related to risk factors, which includes four sections (diagnosis, past history, smoking and alcohol consumption, BMI measures and biochemical measures.

Reliability of the questionnaire form was determined through a pilot study while the content validity of the questionnaire was determined through a panel of experts. And then the Data were collected through the use of the observational tool (questionnaire), which was analyzed through the use of three statistical approaches. They are descriptive statistical analysis (frequencies, percentage, S.D, Range of scores, mean of scores and relative sufficiency; inferential statistical analysis (correlation coefficient and chi- square test); and analysis of variance (ANOVA).

Results:

Table 1. Distribution of Patients according to Socio -Demographic Characteristic (n= 100)

Variable		F	%
Age	<45	7	7.0
	45--49	15	15.0
	50--54	13	13.0
	55--59	17	17.0
	60--64	22	22.0
	=>65years	26	26.0
Sex	Male	78	78.0

Table 1. Continues

	Female	22	22.0
Level of Education	Illiterate	23	23.0
	Read & write	21	21.0
	Primary school graduate	27	27.0
	Secondary school graduate	7	7.0
	Intermediate school graduate	14	14.0
	High Institute graduate	7	7.0
	University & Higher education	1	1.0
Marital status	Single	2	2.0
	Married	84	84.0
	Divorced	1	1.0
	Widowed	13	13.0
Occupation	Unemployed	30	30.0
	Government employee	23	23.0
	Self-employee	10	10.0
	Wife house	18	18.0
	Retired	19	19.0
	No	100	100.0
Monthly income	Sufficient	33	33.0
	Barely sufficient	27	27.0
	Insufficient	40	40.0
Residential area	Rural	73	73.0
	Urban	27	27.0
Smoking	Currently smoke	28	28.0
	Previous smoking	25	25.0
	Not	47	47.0
Alcohol drinking	Drink Currently	0	0
	Previous drinking	0	0
	No	100	100.0

n= number of samples, F= frequency, %=percentage, >=less than, <= greater than

This table shows that the high percentage (26%) of patients ages group (65 years old and more). Most of them (78.0 %) were male. The education level represents (71%) of CAD were low educated (27.0%, 23%, and 21%) of patients were from primary school graduate, illiterate, and read and write respectively. Most of them (84.0%) were married, and (30.0%) were unemployed. The table also shows that a high percentage (40.0%) of sample their monthly income were insufficient, (73%) of patients were living in Rural, and (27.0%) live in Urban. Regarding to smoking and drinking, (53.0%) of CAD patients were smoker, (28.0%) smoke currently, (25.0%) previous smoking, and (47.0%) not smoke cigarette, while (100%) of patient never drink alcohol.

Table 2. Distribution of CAD Patients according to their Clinical Characteristics (n= 100)

Variables	Groups	F	%
Chronic diseases	Hypertension	24	24.0
	Diabetes Mellitus	12	12.0
	High BP & DM	22	22.0
	No Past Medical History	42	42.0
Family history of disease	Hypertension	5	5.0
	Diabetes	6	6.0
	Heart diseases	15	15.0
	No	71	71.0
	High BP & DM	3	3.0
Age of disease onset (years)	<45	9	9.0
	45--49	19	19.0
	50--54	20	20.0
	55--59	14	14.0

Table 2. Continues

	60--64	22	22.0
	=>65years	16	16.0
Frequency of occurrence of disease	Once times	30	30.0
	Twice times	17	17.0
	Three times	23	23.0
	Four times	4	4.0
	Five times & more	26	26.0

n= number of samples, F= frequency, %=percentage, >=less than, <= greater than

The result in table (2) shows that, (46%) of the study sample have hypertension, (28%) have hypertension alone and (22%) of the sample had hypertension and diabetes mellitus to gather, while (34%) of study sample have diabetes mellitus, (12%) alone and 22% with hypertension. Regarding to family history of disease, found 15% of sample family had heart disease. According to age of disease and the frequency of repeated occurrence of disease the data show that higher percentage (22.0%) of patients the disease occurred at age (60-64) years old, and (30%) of patients the symptoms repeated once a time

Table 3. Distribution of Patients according to BMI, Blood pressure and blood sugar measures

Variables		F	%
Body Mass Index (Kg/m2)	BMI>=30	30	30.0
	BMI<30	70	70.0
Body Mass Index (Kg/m2)	Normal (<25)	36	36.0
	Overweight (25-29.9)	34	34.0
	Obese (30-34.9)	19	19.0
	Obese II (=>35)	11	11.0
Blood Pressure	SBP=<140 & DBP<90	54	54.0
	SBP>140 & DBP=>90	46	46.0
Blood sugar	Fasting blood glucose level <126mg/dl	66	66.0
	Fasting blood glucose level ≥126mg/dl	34	34.0

n= number of samples, F= frequency, %=percentage, BMI= body mass index, SBP=systolic blood pressure, Diastolic blood pressure, <= less than, > = greater than, Kg= kilogram, m2= meter square

Table (3) shows that the study sample was distribute into the following percentages according to body mass index and blood Pressure. The data analysis revealed that the most (70%) of CAD patients their body mass index was equal and less than (30 Kg/m2), and the rest were more than (30 Kg/m2). In measuring the blood pressure for the CAD patients the data shows that (54.0%) their systolic blood pressure were (equal & less than 140 mm/ Hg) & diastolic blood pressure less than 90. Regarding to blood sugar 34%of study population their blood sugar more than 126mg/dl, while 66% of study sample were less than 126mg/dl.

Table 4. Distribution of Patients according to Chemistry Blood Level

Variables		F	%
Cholesterol blood level	Normal < 200 mg /dl	76	76.0
	Border line of high risk 200-239.9 mg/dl	7	7.0
	High risk >=240 mg /dl	17	17.0
Triglyceride blood level	Ideal < 150 mg /dl	55	55.0
	Border line of high risk 150-199.9 mg/dl	26	26.0
	High risk >= 200 mg / dl	19	19.0
High Density Lipoprotein (HDL) blood level	High >=40 mg/ dl	42	42.0
	Low < 40 mg /dl	58	58.0
Low Density Lipoprotein (LDL) blood level	Normal (<130 mg /dl)	84	84.0
	Risky (130-159.9 mg/dl)	2	2.0
	High risk >= 160mg/dl	14	14.0

n= number of samples, F= frequency, %=percentage, >=, less than, <= greater than, HDL= High Density Lipoprotein, LDL= Low Density Lipoprotein, mg/dl= Milligrams per Deciliter

Table (4) shows, that the study sample distributed into the following percentages according to cholesterol blood level, triglyceride blood level , high density lipoprotein and low density lipoprotein. According to cholesterol blood level, (17.0%) of patients, were High risk (>=240 mg /dl). Regarding to triglyceride blood level, (19.0%) of CAD patients were high risk (>= 200 mg / dl). Related to high density lipoprotein the table shows that the high percent (58.0%) of sample their (.HDL) were low (less than 40 mg/dl). According to the low density lipoprotein (LDL) higher percentage (84%) of CAD patients were within the normal level (<130 mg /dl), while (14.0%) of sample were high (>=160mg/dl).

Table 5. Comparison of Demographic Characteristic of coronary artery disease (CAD) Patients according to Disease Diagnosis (Angina and myocardial infarction (MI))

Variable	Groups	Angina		MI		P value
		F	%	F	%	
Age	<45	1	2.2	6	10.9	0.260 NS
	45--49	7	15.6	8	14.5	
	50--54	5	11.1	8	14.5	
	55--59	11	24.4	6	10.9	
	60--64	8	17.8	14	25.5	
	=>65years	13	28.9	13	23.6	
Sex	Male	32	71.1	46	83.6	0.133 NS
	Female	13	28.9	9	16.4	
Level of Education	Illiterate	12	26.7	11	20.0	0.385 NS
	Read & write	8	17.8	13	23.6	
	Primary school	8	17.8	19	34.5	
	Secondary school	4	8.9	3	5.5	
	Intermediate school	8	17.8	6	10.9	
	High Institute	4	8.9	3	5.5	
	University &Higher	1	2.2	0	0	
Marital status	Single	1	2.2	1	1.8	0.734 NS
	Married	37	82.2	47	85.5	
	Divorced	1	2.2	0	0	
	Widowed	6	13.3	7	12.7	
Occupation	Unemployed	13	28.9	17	30.9	0.583 NS
	Government employee	9	20.0	14	25.5	
	Self employee	5	11.1	5	9.1	
	Wife house	11	24.4	7	12.7	
	Retired	7	15.6	12	21.8	
Monthly income	Sufficient	19	42.2	14	25.5	0.200 NS
	Barely sufficient	11	24.4	16	29.1	
	Insufficient	15	33.3	25	45.5	
Residential area	Rural	29	64.4	44	80.0	0.081 NS
	Urban	16	35.6	11	20.0	
Smoking	Smoke Currently	8	17.8	20	36.4	0.110 NS
	Previous smoke	12	26.7	13	23.6	
	Not	25	55.6	22	40.0	
Alcoholic drinking	Drink Currently	0	0	0	0	O.C
	Previous Drinker	0	0	0	0	
	No	45	100	55	100	

MI= myocardial infarction, S=significance (p< 0.05); H.S=highly significant (p<0.01); N.S= Non significant (p> 0.05); O.C = out of comparative

Table (5) shows that no statistically significant difference between angina and MI patient at all demographic characteristics.

Table 6. Comparison of Clinical Characteristics of Patients according to Disease Diagnosis (Angina and myocardial infarction (MI))

Items	Variables	Angina		MI		P- value
		F	%	F	%	
Hypertension	Yes	28	62.2	18	32.7	0.003 S
	No	17	37.8	37	67.3	
Diabetes mellitus	Yes	15	33.3	19	34.5	0.899 NS
	No	30	66.7	36	65.5	
Chronic disease	High blood pressure	18	40.0	6	10.9	0.004 S
	Diabetic Mellitus	5	11.1	7	12.7	
	No past medical history	12	26.7	30	54.5	
	High BP and Diabetic	10	22.2	12	21.8	
Family history of Disease	High blood pressure	4	8.9	1	1.8	0.574 NS

F= frequency, %=percentage,

Table (6) shows that there is a statistical significant difference between angina and MI patient related risk factors such as (hypertension) while no statistical significant difference between angina and MI patient related to diabetes mellitus. Regarding to family history of disease there is no statistical significant difference between angina and myocardial infarction.

Table 7. Comparison of BMI Measures, blood pressure & Chemistry Blood Level of patients according to disease diagnosis (Angina and myocardial infarction (MI))

Items	Variables	Angina		MI		P value
		F	%	F	%	
Body Mass Index (Kg/m2)	BMI>=30	16	35.6	14	25.5	0.273 NS
	BMI<30	29	64.4	41	74.5	
Body Mass Index (Kg/m2)	Normal (<25)	15	33.3	21	38.2	0.583 NS
	Overweight (25-29.9)	14	31.1	20	36.4	
	Obese (30-34.9)	9	20.0	10	18.2	
	Obese II (=>35)	7	15.6	4	7.3	
Cholesterol blood level	Normal <200 mg /dl	31	68.9	45	81.8	0.199 NS
	Borderline of risk 200-239.	3	6.7	4	7.3	
	High risk >=240 mg /dl	11	24.4	6	10.9	
Triglyceride blood level	Ideal < 150 mg /dl	24	53.3	31	56.4	0.503 NS
	Borderline risk 150-199.9	14	31.1	12	21.8	
	High risk >= 200 mg / dl	7	15.6	12	21.8	
High Density Lipoprotein (HDL)	High >=40 mg/ dl	19	42.2	23	41.8	0.968 NS
	Low < 40 mg /dl	26	57.8	32	58.2	
Low Density Lipoprotein (LDL)	Normal < 130 mg/dl	35	77.8	49	89.1	0.286 NS
	Risky (130-159.9) mg/dl	1	2.2	1	1.8	
	High risk >= 16 mg/dl	9	20.0	5	9.1	
Blood Pressure	SBP=<140 & DBP<90	20	44.4	34	61.8	0.083 S
	SBP>140 & DBP=>90	25	55.6	21	38.2	

MI= myocardial infarction, MBI= body mass index S=significance (p< 0.05); H.S=Highly significant (p<0.01); N.S= Non significant (p> 0.05); O.C = out of comparative, <= less than, > = greater than

Table (7) shows that there is no statistical significant difference between angina and MI patient related most of risk factors theses are (Body mass index, cholesterol blood level, low density lipoprotein, triglyceride blood level, high density lipoprotein) while a statistical significant difference between angina and MI related blood pressure**.**

Discussion:

Through the data analysis of demographic variables, the present study reported that the CAD patients age is the range between (less than 45 years to 65 years and more) and the high percentage of their age is (65 years and more) which accounts for 26 (26 %). Most of the sample are male 78 (78%), 27 (27%) graduate from primary school. Most of the patients, 84 (84%) were married. And highest percentage 30 (30%) of the patients were an employee.

Regarding the family income the result indicated that (40.0%) of CAD patient their income is insufficient and majority (73 (73.0%) of them were living in Rural. (Table 1) These results agree with evidence is available in the study that indicated the highest percentages of the sample (52.3%) were noticed among the age group 60 years and more, and the highest percentage (76.2%) of patients are male, and (23.8%) were female .The highest percentage (52.3%) was low educational level,(58.5%)were unemployed, (44.6%) low monthly income [5].

The result of the present study has revealed that the prevalence of the smoking is (53%). Even with the CAD attack the (28.0 %) of patient were current smokers, and 25% were previous smokers.

This result supported evidence is available in the study that showed the prevalence of CAD risk factors were, smoking 26.8%, essential hypertension 4.3%, diabetes mellitus 1.3%, dyslipidmeia 55.1%, obesity 13.5% and sedentary lifestyle 64% [6].

This results also supported evidence is available in the studies that showed a high prevalent six risk factors were, smoking 45%, diabetes mellitus 40%, hypertension (38%), hyper triglyceridemia 54%, hypercholesterol-emia 19%, and HDL < 40 mg/dl 60%., history of current smoking 57%, hypertension 35%, history of DM 21%, family history of CAD 23%, and hypercholesterolemia (48%) [7,8].Regarding alcohol consumption the present study revealed no patient consume alcohol, even previous or currently this result, may be due to our value, that the alcohol consumption is not continence with Muslim religion so the patient feel embarrassed to say or write.

According the present study the result shows that (46.0%) of patients have hypertension. This result supported evidence is available in the study that stated the prevalence of hypertension among CAD patients is (38 %) [8].

In the present study, the overall prevalence of history of DM was (34. %) of CAD patients. This result agrees with evidence is available in the studies that mentioned the diabetes mellitus was a high prevalent risk factor and about (more than one third) among CAD patients [8, 9, 10].

The result of the present study showed that the prevalence rate of a relative history of CAD or sudden death was relatively not high in the CAD patients with an overall rate of 15.0%. This result isn't consistent with studies, conducting in Turkey and Egypt where they indicated that the prevalence rates were 53% and 23%, respectively [7, 11].

Regarding to the BMI (body mass index) the present study revealed about a third of CAD patients, their BMI was equal and more than (30Kg/m2). A similar study investigated the epidemiology of hypertension and other CVD risk factors showed an overall prevalence of obesity were (27.7%) [12]. This difference in percentage between Iraqi people and other country may refer to high stress from siege and strong army operations through the war for many years.

According to biochemistry (Lipid profile) the study shows that (17%) of the CAD patients

had total cholesterol levels of 240mg/dl or more. Significant proportions, (7.0% of the patients) were on the borderline high-risk levels (200-239 mg/dl). The prevalence rate of this study is consistent with the study that stated a prevalence rate of hypercholesterolemia were (19%) among CAD patients [8].

Regarding to the triglyceride level the result of the present study shows that (17.0%) of CAD patients had a prevalence were 200 mg/dl and more. This result supported evidence is available in the study that indicated elevated fasting triglyceride level is a risk factor for CAD and CVD, and it works independently from other risk factors [13, 14].

Related to low density lipoprotein the result in (table 4) shows that (14%) of CAD patients, their LDL level were High risk (equal or more than >= 160mg/dl). This result isn't consistent evidence is available in the study that found the prevalence of CAD risk factors were, high LDL 64.4% and low HDL 70.4%, smoking 37%, lack of physical activity 93%, hypertension 74%, diabetes mellitus 60%, family history 44% [15].

Another study found that the prevalence of CAD risk factors were diabetes mellitus 30%, hypertension 90.9%, smoking 42%, history of CAD 13.3%, hypercholesterolemia 41.8%, hyper triglyceridemia 49%, high LDL 63.8%, low HDL 74.4% [10].

Related to high density lipoprotein the result shows that more than half of CAD patients, their HDL level was Low level (less than 40 mg /dl). The elevated of HDL-C blood level decreases the risk of CAD events and vice versa (8, 16). This result consistent evidence is available in the study that found the prevalence of CAD risk factors were, low HDL 70.4%, smoking 37%, lack of physical activity 93%, hypertension 74%, diabetes mellitus 60%, family history 44%. Another study found that the prevalence of CAD risk factors were low HDL 74.4% among CAD patients who admitted in the CCU ward in Iranian general hospital [9, 15].

Recommendation:

1. Conducting educational programs targeting patients and their families, this can be achieved through government organization or non- government organization (NGOs).
2. As diet is one of the major risk factors of CAD, it is essential to find the most effective diet protocol and supply it to CAD patients in order to lose their weight, this can be done cooperating with qualified dietitian.
3. It is important for patients to follow physical activities hourly every day; this must be followed up by health promoters, public health specialist, physicians and cardiologists.

Reference:

1. Nancy S: **A reference manual for nurses on coronary artery nursing,** 3rd ed. Delhi**,** Kumar Publishing House, 2003. P: 3.
2. American Heart Association. **Heart disease and stroke statistics-2008 update**. Retrieved February 8, 2008, from www.american heart.org.
3. Miranda J, Kinra S, Casas J, Smith G, Ebrahim S. :**Non-communicable diseases in low- and middle-income countries: context, determinants and health policy, Trop Med Int Health,** 2008, October, Vol.13(10), p.p 1225- 1234.
4. Potter P, and Perry A**,.: Fundamentals of Nursing** 6th edition, Elsevier Mosby, 2005, p.p 99-100.
5. Sobhi N. El-Yazji.: Coronary Artery Disease Nutritional Assessment Among Adult Population In Gaza Strip, Hospital Based Case-Control Study**. Al-Azhar University of Gaza Deanship of Postgraduate Studies and Research Affairs.** March, 2011, A thesis.
6. Takes D., Israel E. and Shochat T.: **The prevalence of reversible cardiovascular risk factors in Israelis-aged 25-55 years.** Israel

Medical Association Journal. (2006). 8: 173-177

7. Aygul N., Ozdemir K., Abaci A. and Ulka M..: **Prevalence of risk factors of ST segment elevation myocardial infarction in Turkish Patients living in Central Anatolia**. Anadol Cardiology Journal. (2009), Vol. 9: p: 3-8.

8. Ayman J., Hatem T., Ahmed E., Jihad H., Ziad M., Nidal B., Mahmoud I. and Eyas A.: **Prevention of conventional risk in Jordanians with coronary heart disease: The Jordan Hyperlipidemia and Related Targets Study.** International Journal of Cardiology. 2005, Vol.110, p. p179-183.

9. Selvin E. and Erlinger T..: **Prevalence of and risk factors for peripheral arterial disease in the United States.** Circulation. (2004), Vol. 110: pp.: 738-743.

10. Esteghamati A., Abbasi M. and Nakhjavani M.: **Prevalence of diabetes and other cardiovascular risk factors in an Iranian population with acute coronary Syndrome**. Cardiovascular Dialectology. (2006), p: 5-15.

11. Wally H.M., Elayda M.A., Lee V.V., El-Said G. and Reul G.J.: **Risk factors analysis among Egyptian patients who underwent coronary artery bypass surgery.** Texas heart Institute Journal**.** (1997)**,** vol. 24: p: 204-208.

12. Ghannem H. and Hadi A.: **Epidemiology of hypertension and other cardiovascular disease risk factors in the urban population of Soussa, Tunisia.** Eastern Mediterranean Health Journal. (1998),vol.(4) ,p.p 473-479.

13. Washio M., Sasazuki S., Kodama H. and Yoshimasa K. **Role of hypertension, dyslipidemia and diabetes mellitus in the development of coronary arthrosclerosis in Japan**. Japanese Circulation Journal**.** (**2001**). Vol 65: p.p 731-737.

14. Fava S., Herrington D., Reboussin D. and Sherman M.: **Plasma levels of HDL subpopulations and remnant lipoproteins predict the extent of angiographically-88defined coronary artery disease in postmenopausal women.** Atherosclerosis, Thrombosis and Vascular Biology. (2008), Vol 28: p.p 575-579.

15. Mushtaha M.: **Risk Factors of Coronary Artery Disease In Patients Undergoing Cardiac Catheterization in Gaza Governorates: Case-Control Study**. Unpublished master's thesis, Alquds University. Palestine. (2010).

16. Woodward M., Brazi F., Feigin V. and Gue D.: **Association between high-density lipoprotein cholesterol and both stroke and coronary heart disease in the Asia pacific region**. European Heart Journal. (2007), Vol 28: p.p 2653-2660.