

Study of some parameters of cardiovascular heart disease in heart patients and risk factors associated for them in the Middle of Iraq

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Abstract :

The cardiovascular system and atherosclerosis (the development of fibrofatty lesions in the artery wall) are important causes of illness and mortality worldwide. These conditions include peripheral artery disease, which is debilitating, and most myocardial infarctions and strokes. In our study, new parameter were studied to determine the duration of their effect on patients with cardiovascular disease, which is the protein enzyme. meprin α It is a zinc matrix metalloproteinase and may contribute to cardiac remodeling. However, the second determinant is the abundance of plasma cooling antioxidant hemoglobin (Hp) Hp 2-2, which increases sooner owing to the danger of cardiac proliferation and CRP concentration. In patients with high levels of glycated hemoglobin (HbA1c) and high-quality lipoprotein (the particle that can lead to solid heart lesions), With the risk of vascular and non-vascular outcomes under various conditions, it turns into sterol in all pediatric patients, in addition to high urea, creatinine, and liver enzymes. The additional risk of problems resulting from atherosclerosis, namely body mass and age, in addition to smoking and blood pressure, was excluded.

Key word. Cardiovascular, atherosclerosis ,meprin α , risk factors, diabetes ,HP.

دراسة بعض مؤشرات أمراض القلب والأوعية الدموية في مرضى القلب وعوامل الخطر المصاحبة لهم في وسط العراق

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مستخلص

في جميع أنحاء العالم، يعد نظام القلب والأوعية الدموية وتصلب الشرايين - تطور الآفات الدهنية الليفية في جدار الشرايين - من المساهمين الرئيسيين في الإصابة بالأمراض والوفاة. تشمل هذه الحالات مرض الشريان المحيطي، وهو أمر منهك، وأغلب حالات احتشاء عضلة القلب والسكتات الدماغية. في دراستنا هذه تم دراسة متغيرات جديدة لمعرفة مدة تأثيرها على مرضى القلب والأوعية الدموية وهو إنزيم البروتين المعدني الزنك (Mep1a) Meprin α الذي يلعب دور مهم في تنظيم الاستجابة الالتهابية والتليف، وقد يلعب دورًا في إعادة تشكيل القلب. أما المتغير الآخر البروتين البلازما الوفير ذو الصفات المضادة للأوكسدة الهيموجلوبين (Hp) ارتبط النمط الجيني Hp 2-2 سابقًا بزيادة خطر الإصابة بأمراض القلب الناتجة وتركيز CRP. في أولئك المرضى الذين لديهم نسبة عالية من الهيموجلوبين الغليكوز (HbA1c) والبروتين الدهني منخفض الكثافة (الجسيم الذي من المحتمل أن يستلزم تكوين آفات تصلب الشرايين)، مع خطر النتائج الوعائية وغير الوعائية في ظل ظروف مختلفة ينقل الكوليسترول في جميع أنحاء مجرى الدم إضافة الى ارتفاع اليوريا والكرياتينين وانزيمات الكبد. كم تم دراسة عوامل الخطر الإضافية لمشاكل التخثر الناتجة عن تصلب الشرايين وهي كتلة الجسم والعمر إضافة الى التدخين وارتفاع ضغط الدم.

الكلمات الرئيسية: القلب والأوعية الدموية، تصلب الشرايين، α ميبرين ، عوامل الخطر، مرض السكري، HP.

Introduction

The cardiovascular system is made up of the heart and its blood vessels. The cardiovascular system can have many different issues, some of which include anomalies of the conduction system, rheumatic heart disease, and endocarditis. Heart disease, or cardiovascular illness, encompasses the following four conditions: coronary heart disease (CHD), commonly known as coronary artery disease (CAD) One of the main causes of ischemic stroke is atherosclerosis, which takes a while to manifest clinically before acute events start to happen. Stroke is the second greatest cause of mortality globally and a public health concern. ^[1], Due to the high proportion of residual impairment, this places a significant cost on both people and society ^[2]. Consequently, it's critical to avoid the illness at the subclinical stage ^[3]. Since these two indicators were most often employed, we chose increased carotid intima media thickness (CIMT) and the presence of carotid plaque among the various stages of carotid atherosclerosis ^[4]. The features that link risk factors and atherogenesis have been extensively documented

by researchers. The intermediary effectors between the risk factors and illnesses like ischemic heart disease include thrombosis and inflammation. ^[5,6]. Meprin- α , a zinc metalloprotease, has been linked to a pro-inflammatory activity that results in ECM remodeling and may potentially play a role in cardiac remodeling. It has been previously shown that meprin α participates in the control of inflammatory response and fibrosis metalloproteases^[7]. Heart failure develops as a result of psychopathic cardiac remodeling, which is characterized by excessive extracellular matrix protein deposition and cardiac hypertrophy[8]. A plasma protein called hemoglobin (Hp) binds extra corpuscular hemoglobin (Hb) and stops it from causing tissue damage caused by iron-mediated oxidative stress. There are two main alleles of the HP gene: Hp1 and Hp2. The latter is specific to humans and is a mutant variant of the former. Three different proteins with different structures and functions result from this shared polymorphism (rs72294371), Cardiovascular disease (CVD) may have a high percentage risk associated with the Hp 22- genotype ^[9,10].

Relies on the conventional risk

factors of smoking, systolic blood pressure, total cholesterol, low-density lipoprotein (LDL) cholesterol, high-density lipoprotein (HDL) cholesterol, age, and sex. In contrast, risk factors such as age, triglycerides, smoking, HDL cholesterol, systolic blood pressure, family history of premature myocardial infarction (MI), diabetes mellitus, and LDL cholesterol are recognized in the more modern Prospective Cardiovascular Münster (PROCAM) simple scoring scheme^[11]. Refer^[12]. The first person to report a link between cardiovascular disease (CVD) and chronic kidney disease (CKD) was British physician Richard Bright.^[13] More and more data point to a consistent relationship between albuminuria and cardiovascular risk in both renal and non-renal populations^[14, 15]. Albuminuria may serve as a prognostic indicator for either renal or cardiovascular risk, or both. In^[16] Independent of eGFR, higher albuminuria levels are associated with a graded increase in mortality risk. Emerging data also points to a link between HCV and CVD, with 1.5 million fewer disability-adjusted life years lost annually due to CVD linked to HCV infection^[17, 18]. In low- and

middle-income nations, the prevalence of HBV and HCV infections is still rising. Prolonged chronic infection can cause chronic inflammation and metabolic disturbances, which might eventually result in the development of CVD^[20]. C-reactive protein (CRP), a plasma protein synthesized by the liver, is a sensitive and dynamic systemic marker of inflammation^[21].

Supplies and techniques

Study design: In Baghdad and Salah Dine City, in the center of Iraq, 100 people between the ages of (35 and 75) years 70 was patinate and 30 control participated in this study. Samples were collected from February 1, 2023, to November 30, 2023. Examined were the biological characteristics, behavioral patterns, demographic data, and medical histories of a few disorders. It was determined what the cardiovascular disease was more prevalent than average to evaluate the disparity in cardiovascular incidence between men and women, the log-rank test was computed.

Blood Sample Gathering and Handling

All individuals had blood samples obtained from an arm vein using a disposable plastic syringe; about 5

milliliters of blood were drawn .Each blood sample is drawn into a separate tube, which typically has a tight-fitting cover, containing 5 ml. It has a gel tube that serves as an insulating layer and allows the serum to be separated. Using a centrifuge running at 3000 rpm for five minutes, the blood components were rapidly separated into serum and coagulant. Serum from both healthy and heart disease patients was separated. Until they were employed in biochemical assays, the pieces were stored at -20°C in a deep freezer.

Determination of biochemical per blood serum: Meprin α enzyme activity in blood was determined using an assay kit according to manufactured procedure (Bioassay Technology Laboratory, Cat. NoE0387Hu, Shanghai, China).

Serum human Haptoglobin has been determined by using ELISA kit assayed according to the manufactured procedure (Fine Biotech Co, Cat. No. EH1057China).

Determination of cholesterol in blood serum

The enzymatic method was adopted to measure the total cholesterol level in buttermilk, using a frozen analysis kit supplied by the company France-

Biolabo.

Statistical analysis

The results were analyzed statistically using Statistical analysis (Anova), and the values presented in the tables represent (Mean \pm SD). The t-test was used to compare the groups to analyze the results of patients and molar. The coefficients were set at $P < 0.05$. ($P < 0.01$), and the data shapes were drawn using Excel (2017 AD).

Results

According to Table (1), which presents the study's results, males are more likely than women to get cardiovascular disease. The increase in risk was statistically significant ($p < 0.05$). The test revealed a statistically significant difference in the incidence of diabetes, hypertension, and cardiovascular illnesses in men and women, as well as between age groups as well as educational attainment. Multiple regression analysis results showed that as people age, their chance of acquiring CVDs increases. Age was a key factor in the rise in patient mean (56.03.2 \pm) compared the patient women (52.82.4 \pm), Premature cardiovascular disease in the family history revealed no noteworthy in men(24.647 \pm 2.391)

compared the women (26.310 ± 2.958). There was a decline in body mass index (BMI), in men (82.70 ± 2.4) while in the women was (84.04 ± 1.8) kg/m^2 . The level of hypertension increased in men ($145.321.4 \pm$) compared the women ($149.0020.9 \pm$), smoking patients in men was increase (75 ± 19.5) comparison to the smoking patients women (67 ± 20.7).

Table (1) The Effect of some parameters in patient of cardiovascular men compered with women

Variable	Men With CVD Mean \pm S.D	T value	Women With CVD Mean \pm S.D	p value
Age	$56.03.2 \pm$	0.78	$52.82.4 \pm$	0.439
Family history of premature cardiovascular disease	24.647 ± 2.391	0.034	26.310 ± 2.958	0.622
BMI	82.70 ± 2.4	-0.44	84.04 ± 1.8	0.660
Hypertension	$145.321.4 \pm$	0.23	$149.0020.9 \pm$	0.225
Smoking	75 ± 19.5	1.45	67 ± 20.7	0.714

Cardiovascular disease in table (2), the risk of cardiovascular disease. The significant increase in the level of meprin α enzyme reaching (88.00 ± 1.4) U/L for patients men, while the activity meprin α in the women was (80.73 ± 2.0) U/L.

Fig(1) The level of Meprin α enzyme between men and women in patinate cardiovascular disease (CVD).

and showed a significant increase in the level of haptoglobin in men (29.50 ± 1.4) compared the women was (19.09 ± 1.1).

Fig(1) The level of haptoglobin

between men and women in patinate cardiovascular disease (CVD).

The C-reactive protein (CRP) a significant increase in the level of crp in men ($2.90.52 \pm$) compared the women was ($2.30.16 \pm$). Blood Sugar is higher in men (230.0 ± 3.9) while in women was ($161.31.5 \pm$), The no significant in the level of blood urea in patient men ($62.111 \pm$) while the patients women was ($61.418 \pm$). The increase of creatinine in patent men ($1.8400.062 \pm$) compared in women (0.879 ± 0.083), Total cholesterol was increase in patient men ($182.53.8 \pm$) compared patients

women (180.44.2±).

while decrease triglyceride levels in men(2154.8±) compared of the women(2274.3±).The a significant HDL cholesterol was decrease in men was(57.413.9±) while in women was (59.317.0±). The a alkaline phosphate was decrease in patinate men (1402.8±)

compared the women(1733.1±) while the AST (aspartate aminotransferase) in men was higher compared with women (36.21.106±) and ALT (Alanine Aminotransferase) in men was increased (63.612.6±) compered the women (62.110.3±).

Table (2) The Effect of some parameters in patient of cardiovascular between men and women

Parameters	Men With CVD Mean ±S.D	T value	Women With CVD Mean± S.D	P value
Meprin α enzyme	±1.4 88.00	**3.01	±2.0 80.73	0.004
Haptoglobin	±1.4 29.50	** 3.16	±1.1 19.09	0.004
Blood Sugar	3.9 230.0±	2.65	1.5±161.3	0.037
Blood Urea	11±62.1	0.03ns	±18 61.4	0.973
Creatinine	0.062±1.840	*2.43	±0.083 0.879	0.056
TG	4.8±215	-0.34	4.3±227	0.737
Cholesterol	3.8±182.5	0.15	±4.2 180.4	0.882
HDL	13.9±57.4	0.06	17.0±59.3	0.623
C-reactive protein (CRP)mg/l	0.52±2.9	0.12	0.16±2.3	0.436
ALP	2.8±140	0.78	3.1±173	0.441
AST	1.610±49.9	*2.42	±1.106 36.2	0.021
ALT	12.6±63.6	0.65	10.3±62.1	0.417

Dissociation:-

The study calculated risk factors and incidence rates. Cardiovascular diseases in central Iraqi adults aged 35

to 75 were studied in 100 subjects over a ten-month period.. The Framingham research According to estimates by Donald et al., there are 15.7 incidences

of CVDs for every 1000 people year [22]. According to this study, chronic renal disease is the biggest risk factor for CVDs after the age of 50–70. According to the findings of this study and another, renal impairment has been linked to a twofold increase in the risk of cardiovascular disease [23]. Additionally, Chen et al. found that individuals with chronic renal disease who were between the ages of 35 and 65 were at an increased risk of getting cardiovascular diseases (CVDs). [24]. Nonetheless, a number of particular characteristics in individuals with chronic renal disease may raise The age difference in the research cohort—our patients were 40 to 75 years old, whereas Donald et al.'s study covered individuals 50 years of age and above. is most likely the cause of the discrepancy in incidence density between our study and theirs. the chance of acquiring cardiovascular diseases (CVDs), such as oxidative stress, albuminuria, hyperparathyroidism, and anemia brought on by renal disease [25]. Due to left ventricular hypertrophy and dysfunction brought on by anemia brought on by poor renal function, the risk of CVDs and death is increased

fourfold. According to other research, albuminuria raises the incidence of CVDs by twofold and is a significant factor in their etiology. In this study, diabetes was also presented as a risk factor. In their cohort research on diabetics over 30 years in England, Dinesh Shah et al. found a strong and positive correlation between diabetes and the incidence of CVDs [26]. Diabetes was found to be the greatest risk factor for CVDs by Donald and colleagues in the Framingham Cohort Study, which included participants over 50. Furthermore, Lee et al. found that diabetics had a 1.77-fold increased risk of having CVDs compared to non-diabetics in a cohort study involving 2879 males in Singapore. [27]. Cardiovascular disease was more common in males with diabetes than in women with the condition, and it was three times as common in women without diabetes .In Persistent hyperglycemia increases the likelihood of microalbuminuria. The hypothesis that type 2 diabetes, coronary atherosclerosis, and microalbuminuria all share a similar pathophysiological mechanism is supported by the concurrent emergence of these disorders throughout follow-up[28].

More specifically, baseline microalbuminuria and silent myocardial ischemia were strong predictors of patients' future risk of coronary heart disease [29]. Reportedly, diabetes is associated with 7.3% of cardiovascular diseases in Iraq [30]. However, there are more common risk factors for diabetes and CVDs, such as obesity, smoking, age over 45, poor nutrition, stress, and hypertension. Have an unavoidable impact [31]. Moreover, diabetics frequently lead hazardous lifestyles, particularly those who are not old and have a college degree [30]. According to Donald et al., hypertension was strongly linked to the risk of CVDs in the Framingham Cohort analysis, which included individuals over 50. This finding was also observed in the current analysis, where the risk of CVDs in participants was 68% higher in men than in women with hypertension [16]. A Singaporean cohort study found that hypertension is the main risk factor for CVDs [21]. The frequency of CVDs differs across the sexes for a number of reasons, including biological variations and sex hormones, including estrogens and androgens [32]. Before the age of 50, males are more likely than women to suffer CVDs, while women's risk

rises with menopause and other hormonal changes. Other factors that may be protective for women include preeclampsia, pregnancy-related illnesses including diabetes and high blood pressure, and hormonal changes. The results of the current study showed a significant relationship between triglyceride and cholesterol levels and the chance of developing CVDs. The results of the study conducted on 180 persons and the risk of developing CVDs. Ravin and colleagues reported that the risk of CVD rose with age, which is consistent with the findings of our investigation. Researchers have discovered that while growing older contributes to the development of CVD on its own, it can also reflect the degree and length of exposure to other CVD risk factors [33]. There is no statistically significant correlation between cardiovascular disease in males and women's body mass index, according to the current study. She is fat and overweight. In several instances when Stu passes away, these have been proposed as risk factors for cardiovascular disease [34–35]. However, The Obesity Paradox has been mentioned as a significant contributing element in the association between

obesity and CVD in certain research^[36, 37]. Also, it has been said that even though obesity rates are rising. Obesity sufferers and risk factors for cardiovascular disease can negatively impact the anatomy and function of the heart arteries. It often has a better prognosis and a lower death rate from heart-related conditions. Many factors have been mentioned by Lavie and colleagues as contributing to the disparity between obesity and CVD. The risk of CVD and all-cause mortality were shown to be positively correlated in this study, whereas type 2 diabetes and high blood sugar were associated with elevated liver enzymes and both ALT and AST deposition of fat in the liver. It is linked to vascular inflammation, which might be an indication of weak, easily ruptured atherosclerotic plaques. The likelihood of developing metabolic syndrome and the buildup of visceral fat are both strongly correlated with ALT levels. Liver enzyme tests are an inexpensive, straightforward, sensitive, and standardized technique that can help with the evaluation of cardiovascular risk^[38]. The potential of meprin α to break down extracellular matrix (ECM) proteins, process proinflammatory

cytokines, and encourage leukocyte infiltration has been discovered recently, and these findings have rekindled interest in meprin α research across a variety of disorders, beginning with acute kidney injury (AKI). and infections cause heart disease and cancer. was shown to be higher among heart disease patients in the research, just as it was found to be higher in males than in women. The body's inflammatory response throughout the condition is linked to this enzyme's involvement with heart disease. Epidemiological studies have discovered a high correlation between the likelihood of developing CVDs and indicators of inflammation and fibrosis. Through the use of meprin α , which may treat heart disease and lower the risk of heart attacks, this study demonstrated the connection between the high rate of inflammation and the detection of cardiovascular disorders. It is connected to diabetes, excessive fat, and renal inflammation all of which have a direct bearing on heart disease^[39]. Met globin According to the current investigation, the HP type is independently Haptoglobin levels were found to be greater in heart disease patients than in non-patients, and in

males more frequently than in females. Hemoglobin (Hp) is the first line of defense against the damaging effects of free hemoglobin. Its primary job is to bind to free hemoglobin, create the Hb-Hp complex, and stop iron from being excreted by the kidneys^[40]. Launched in the summer of 1990, the Bruneck Study comprised a random sample of one thousand men and women. With an emphasis on atherosclerosis, cardiovascular disease, aging and lifespan, neurological illnesses, bone problems, and cancer, the researchers assessed disease epidemiology along with several other variables^[41]. In each of these studies, preserved serum or plasma specimens that were taken from the participants at the beginning of the experiment were used for HP type, Associations of CRP with vascular and non-vascular outcomes were each of broadly similar size although our results support the idea that some process related to persistent inflammation is associated with vascular disease and other chronic disorders, most of the association with ischemic vascular disease depends on conventional risk factors^{[42][43][44]}.

Conclusion

Higher levels of meprin and haptoglobin, diabetes, hypertension, age, male and female sex, smoking, hyperlipidemia, and obesity were identified as risk factors for cardiovascular disease in the research. Because diabetes, high blood pressure, and smoking are all manageable risk factors, eliminating them would significantly reduce the incidence of cardiovascular disease. As a result, strategies for appropriate steps to reduce these risk factors must be devised.

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