Assessment of Primary Prevention Measures for Cardiovascular Risk among a Sample of Iraqi Subjects: A preliminary retrospective study

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Abstract

Background: Cardiovascular disease currently considered as a main health issue and the biggest cause of death world wild. This study was performed to evaluate the application of primary prevention criteria in practice on Iraqi subject to assess their cardiovascular risk.

Patients and Method: We retrospectively implement the Framingham risk score to estimate the 5-yearrisk probability for developing cardiovascular disease. All subjects have a sequential personal data for five years (from 2010 until 2014) including; Age, body mass index, lipid profile & blood pressure measurements were obtained either from patient's medical documents, physical examinations, or communication with medical staff.

Results: The cardiovascular disease prediction scoresfor both women and men up ceiling over the five years. The average 5 years cardiovascular disease prediction scorewashigherfor men compared to that for women (15.52%) vs. (5.26%), respectively.

Conclusion:the study was concluded that Iraqi subjects may have intermediate or high cardiovascular risk for primary assessment that should be monitored and treated. Further assessment is critically warranted.

التقييم المبدئي للوقاية الأولية للأصابة بأمراض شرايين الدم وأمراض القلب عند عينة من المرضى العراقيين : دراسة أولية رجعية

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الملخص

الخلفية:يعد مرض القلب والاوعية الدموية في الوقت الحالي قضية صحية رئيسة واكبر سبب للوفاة في العالم. اجريت هذه الدراسة لتقييم تطبيق معايير الوقاية الاولية في الممارسة على العراق تخضع لتقييم مخاطر القلب والاوعية الدموية.

المرضى والطرق: نفذ وبأثر رجعي درجة خطر فرامينكهام لتقدير احتمال الاصابة بأمراض القلب والاوعية الدموية لمدة خمس سنوات. جميع الاشخاص قيد الدرلسة لديهم بيانلت شخصية متتابعة لمدة خمس سنوات (من 2010 حتى 2014) حيث تم الحصول على معلومات المرضى كالعمر، مؤشر كتلة الجسم، مستوى الدهون وقياس ضغط الدم وذلك من خلال الوثائق الطبية للمريض والفحوصات البدنية والتواصل مع الطاقم الطبي.

النتائج: درجات التنبؤ بأمراض القلب والاوعية الدموية لكل من النساء والرجال في تصاعد على مدى السنوات الخمس. وكان متةسط معدل التنبؤ بأمراض القلب والاوعية الدموية للخمس سنوات اعلى بالنسبة للرجال مقارنة بالنساء (15.52%) مقابل (5.26%) على التوالي.

الاستنتاجات: من هذه الدراسة نخلص الى ان الاشخاص العراقيين قد يكون لهم مخاطر متوسطة او عالية في القلب والاوعية الدموية للتقييم الاولي والتي ينبغي رصدها ومعالجتها، كما من الضروري اجراء مزيد من التقييم مستقبلا.

Introduction

Cardiovascular disease (CVD) currently considered as a main health issue and the biggest cause of death world wild.[1,2] The condition is often silent without warning symptoms, thus recognizing factors that may be linked with the occurrence of CVD have become the essential approach in order to find a preventive strategies for reducing the onset and burden of CVD and unfavorable consequences.[3]

Existing CVD or a previous cardiovascular problem is considered the powerful predictor for another cardiovascular event in future.[4] Other factors may increase cardiovascular risk like age, gender, smoking, dyslipidemia, high blood pressure and diabetes mellitus are important predictors for future CVD,[5] these measures put together the score that estimate the individual's cardiovascular future risk.[6,7]

Age by far an independent risk factor and the most powerful in developing CVD, incidence of stroke shown to be doubles every decade in adult after age 55.[8] It has been thought that the risk of the age is related to changing in the vascular wall structure as well as its mechanical properties.[9] Besides, elevated serum cholesterol level; especially low density lipoprotein cholesterol (LDL-C) and low level of high density lipoprotein cholesterol (HDL-C);[10] represented by dyslipidemia which in turn serving as another contributor to an increased probability of cardiovascular events.[11]

Smoking, as another causative factor, found to cause nearly 10% of cardiovascular events. Furthermore many studies displayed many evidence confirmed the good effect of stop smoking on CVD regress.[12,13]

The chance of having CVD found to be higher in diabetic than in non-diabetic patients, individuals have diabetes mellitus are 2-4 times more likely to have heart disease.[14,15] and CVD cause death in about 65% of diabetic individuals.[16] While hypertension considered quantitatively the most important risk factor for early CVD, making it commonest predictor than cigarette smoking, dyslipidemia, and diabetes. Globally, hypertension considers the main causative for a valuated 54% of

all stroke events and 47% of all ischemic heart disease, thus indicate that elevated systolic blood pressure is an independent and strong risk factor for CVD. [17,18]

Aim of the present study, to implement the Framingham risk score (FRS) for primary prevention that estimate 5-year risk probability for developing CVD.

Patients and Methods

This study is a retrospective design and selection criteria for the Original Framingham Heart Study,[19]carried out on 150 randomly selected subjects (75 males and 75 females) from the attendees to Baghdad Medical City/ Baghdad/ Iraq who were free of prevalent CVD, (24-79) years old with almost no missing information. Participants underwent a physical examination, anthropometry, blood pressure determination. Serum total cholesterol and HDL cholesterol levels were determined by standardized enzymatic methods. Cigarette smoking status was obtained from patient's history. Antihypertensive medication use was obtained by the examiner physician. All subjects have a sequential personal data for five years (from 2010 until 2014) including; Age, BMI, lipid profile & blood pressure measurements were obtained either from patient's medical documents, physical examinations, or communication with medical staff.All included subjects provided written informed consent, and the study protocol was approved by the institution ethical committee.

Statistical Analysis:

Data were analyzed using a computer program for windows XP, Microsoft excel. The results reported in this study were expressed as percent risks in correlation with different risks factors that may lead to CVD. P-value <0.05 was considered significant.

Results

The demographic characteristics of selected subjects including age, BMI and gender are shown in table (1). The age range from 24-79years with a mean of (57.64 ± 11.42) years. The BMI range between 21.6-48.4 kg/m^2 with a mean of (31.19 ± 5.61) kg/m^2, table (1).

Table (1): Demographic characteristics of selected subjects

Variable	**Value**
Age (year)	57.64 ± 11.42
BMI (kg/m^2)	31.19 ± 5.61
Gender **Male n (%)** **Female n (%)**	 75 (50%) 75 (50%)

Data are given as mean ± standard deviation; n,number of subjects; %, percentage**.**

The summary for risk factors in middle-aged sample for both men and women are shown in table (2). The mean levels of serum HDL and LDL cholesterol were comparable in both men and women, hence, the total cholesterol and triglyceride levels were higher in women compared to men. The systolic blood pressure was higher in women as well.

Table (2) Summary for risk factors used in selected subjects

Risk Factors	**Women (n= 75) FOC**	**Men (n= 75) FOC**
Age (year)	59.15 ± 7.01	56.29 ± 12.47
BMI (kg/m^2)	31.58 ± 4.34	30.72 ± 4.33
Total-C (mg/dl)	198.04 ± 50.12	183.69 ± 47.62
HDL-C (mg/dl)	40.24 ± 5.34	40.23 ± 6.17
LDL-C (mg/dl)	139.71 ± 47.54	139.73 ± 50.51

Risk Factors	Women (n= 75) FOC	Men (n= 75) FOC
TG (mg/dl)	164.45 ± 69.62	150.01 ± 64.62
Systolic BP (mm Hg)	140.43 ± 17.28	138.35 ± 18.06

Data are givenas mean ± standard deviation; n, number; FOC, framingham original cohort; Total-C, total cholesterol; HDL-C, HDL cholesterol; BP, blood pressure.

The CVD prediction scoresfor women and men up ceiling over the five years are provided in tables (3). The average 5 years CVD prediction scorewashigherfor men compared to that for women (15.52**%**) vs. (5.26**%**), respectively.

Table (3) CVD prediction scores for men and women

Years	Average Score % for Women	Average Score % for Men	p-value
Year 1	4.22	13.01	0.064
Year 2	4.93	14.15	0.065
Year 3	5.01	14.89	0.053
Year 4	5.48	16.31*	0.042
Year 5	6.64	19.25*	0.029
Average 5 years Score (%)	5.26	15.52*	0.049

Data are given as percentage (%)**.**

Distribution of CVD prediction scores in men and women according to age group showed that men score was significantly higher than women score ($p<0.01$) for the same age group, as shown in table (4).

Table (4): CVD prediction scores of men and women according to age group

Age Group	No. (Men)	No. (Women)	Score % (Men)	Score % (Women)	p-value
21-30	4	-	3.81	-	-
31-40	6	-	6.00	-	-
41-50	9	6	14.65	1.93	<0.01
51-60	23	44	15.22	3.64	<0.01
61-70	23	18	18.52	7.58	<0.01
71-80	10	7	19.74	11.71	<0.01

Discussion

The Framingham risk score can be adopted for predicting the probability of CVD in individuals with or without previous cardiovascular episode.[20] In Iraq, patients already having CVD are following the total secondary preventions program to avoid further cardiovascular complications.

In present study, the lipid profile, particularly total cholesterol, was higher in women compared to that of men along with the blood pressure readings. Comparable findings was found in D'Agostino *et al* study in both women and men.[21] After applying FRS, there was dramatic change in the risk score in men over the five years to yield 15.52% average CVD risk. In women despite of the metabolic changes, the risk score was lower than that in men with average of 5.26% [22] Besides, CVD risk was markedly increased with age in both men and women. [23]

Although this study is considered a preliminary evaluation for CVD on Iraqi individuals with limiting statistics, but comparable importance was notice since there is a prevalence of lipid-related disorders which mostly results from lifestyle changes, particularly in middle east populations .[24,25] Accordingly, in developing countriescardiovascular-related screening strategies were applied to detect the populations at high cardiovascular risk.[26]

The guidelines looking for the role of statins in the prevention of CVD stated that the decrease in LDL-C level (for every 1-mmol/L reduction) can reduce the relative mortality risk by about 20%.[27,28] Other statins guideline elucidated that diabetic patients are not obviously considered to be at high CVD risk [29], however, guidelines based on clinical practice for the primary prevention of CVD and type 2 diabetes mellitus being developed in both gender patients at CVD risk.[30]

Limitations

The major limitations of the present study are; the lack of large sample size that is under constant monitoring, difficulty applying the same standardized criterion on CVD patients retrospectively for 10 years, also the lack in applying and directing these risk scores to improve the patient outcomes through the communication tools with the patients. Additionally, other tools of FRS appear to be movable along with some recalibration.

Conclusion

From this study we conclude that Iraqi subjects may have intermediate or high cardiovascular risk for primary assessment that should be monitored and treated. However, a large scale screening study applying Framingham scoring system in Iraqi individuals annually, and monitoring patients with pre existing CVD for their secondary prevention are critically warranted.

Recommendations

We recommend making more efforts by medical staff in Iraqi medical organizations to educate Iraqi people about factors that can increase the risk of heart disease in order to reduce the threat of CVD and mortality rate.

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