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Brief Report

The Prevalence of Coronary Risk Factors in Iranian Lor Migrating Tribe

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Cardiovascular diseases are the major causes of death in Iran. The aim of this study was to determine the prevalence of conventional risk factors for coronary artery disease in Lor migrating tribes in southern part of Iran. Two hundred six persons of Lor migrating tribes in Mamasani, southern Iran (age range, 21 – 80 years) were randomly enrolled in the study. Their serum total cholesterol, triglyceride, high- density lipoprotein, low- density lipoprotein, and fasting blood sugar were determined. Of the participants, 79.9% were smokers. The prevalence of hypertension was 37.4% (mostly grade 1), 3.6% had diabetes mellitus, and 14.7% had impaired fasting glucose. A cholesterol level of more than 240 mg/dL was found in 7.1% of the participants, 27.8% had a low-density lipoprotein level of more than 130 mg/dL, 38.9% had a high- density lipoprotein level of less than 40 mg/dL, and 25.2% had a triglyceride level of more than 200 mg/dL. Body mass index greater than 25 was found in 34.8% of the participants, and 57.1% had intermediate and high risk for coronary events. The prevalence of conventional risk factors for coronary artery disease in Lor migrating tribes in comparison with Tehran urban population was very high.

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Introduction

Cardiovascular diseases are the major causes of death in Iran.[1] Cardiovascular risk factors were first reported by Framingham Heart Study in early 1960s. Most risk factors used in daily practices have demonstrated a consistent graded-response effect and are substantiated by a long series of consistent prospective, epidemiologic studies in broad populations.[2]

This study determines the prevalence of conventional risk factors of coronary artery disease (CAD) in migrating Lor tribes living in south of Iran.

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Materials and Methods

In a systematic random sampling method from October 2004 through February 2005, a total of 307 family members of a migrating tribe named Mamasani Lor in southern Iran entered our study. Of them 216 individuals (age range, 21 – 80 years) were interviewed and underwent a clinical examination. The classification of hypertension was based on the sixth report of Joint National Committee on Prevention, Evaluation, and Treatment of High Blood Pressure.[3] Body weight was measured by a digital scale with an accuracy of ±100 g. The participants were weighed shoeless, in light clothing. Standing height was measured shoeless to the nearest 0.5 cm with the use of commercial studiometer, with the shoulder in the relaxed position and arms hanging freely.[4]

Body mass index (BMI) was calculated by dividing weight (kg) by height squared (m^2). Overweight was defined as a BMI of 25 – 29.9, and obesity as a BMI of ≥30. After an overnight fasting, the blood samples were taken from all participants and serum total cholesterol,

triglyceride, high- density lipoprotein (HDL), low-density lipoprotein (LDL), and fasting plasma glucose (FPG) were measured. Glucose level was classified into three categories based on the FPG. While FPG <110 mg/dL was considered normal, FPG ≥ 110 mg/dL but <126 mg/dL was defined as impaired fasting glucose (IFG), and FPG ≥126 warranted the diagnosis of diabetes mellitus(DM).[5] Method of enzymatic calorimetric determination was performed to measure the plasma level of glucose, cholesterol, and its subtypes, and triglyceride.

Risk of coronary events in future 10 years was determined according to National Cholesterol Education Program Adult Treatment Panel III (NCEP-ATP III). Absolute risk was divided into three groups: high (>10%), intermediate (1 – 10%), and low (<1%).[6]

Chi square, Pearson correlation coefficient, and *t*-tests were used for statistical analysis and a *P* value of less than 0.05 was considered significant.

This study was approved by the Ethical Committee of Shiraz University of Medical Sciences, and informed consent was obtained from all the participants.

Results

Eighteen subjects were excluded from the study because of inadequate fasting and missing blood samples. The remaining 198 subjects, including 73 (36.9%) males and 125 (63.1%) females entered our study. The average age of men was higher than women (48.4 vs. 44.1, $P<0.05$).

Blood pressure (BP)

Seventy-four (37.4%) subjects were hypertensive. Of them 34 (17.2%) had grade 1 hypertension, 23 (11.6%) had grade 2, and 17 (8.6%) had grade 3. Fifty-six (28.3%) individuals had optimal BP, 43 (21.7%) had normal BP, and 25 (12.6%) had high normal BP. The prevalence of hypertension did not differ in men and women ($P>0.05$).

Hypertension had a positive correlation with smoking, increase of age, and serum triglyceride level. Also, a positive correlation was noticed between hypertension and BMI in women.

Diabetes mellitus (DM)

Seven (3.6%) persons had DM and 29 (14.7%) had IFG.

Cholesterol, LDL, and HDL

One hundred forty (70.7%) participants had cholesterol levels less than 200 mg/dL, 44 (22.2%) had cholesterol levels in the range of 200 – 239 mg/dL, and 14 (7.1%) had levels more than 200 mg/dL. The difference of cholesterol levels between men and women was not significant. Cholesterol level showed a significant correlation with age (Figure 1) and BMI. But no significant

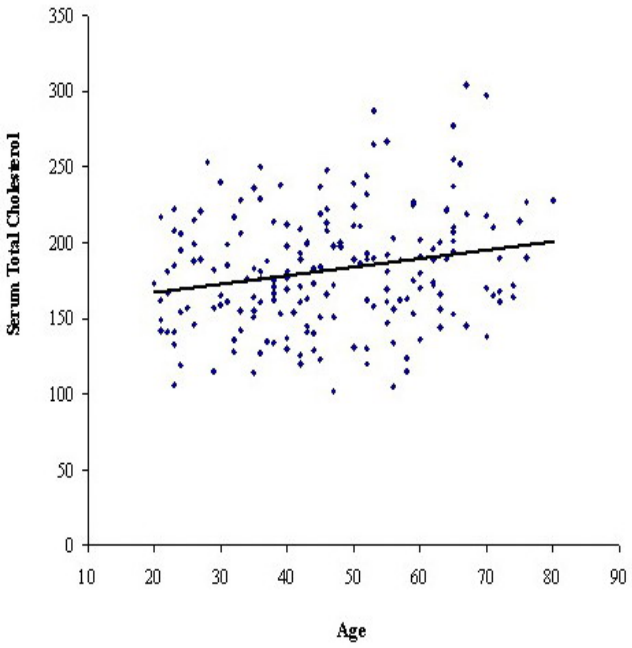

Figure 1. Correlation between serum total cholesterol and age.

correlation was observed between cholesterol level and cigarette and water pipe smoking. Eighty- six (43.5%) participants had LDL less than 100 mg/dL, 57 (28.8%) had LDL levels in the range of 100 – 129 mg/dL, 43 (21.5%) had LDL levels in the range of 130 – 159 mg/dL, 8 (4.2%) had LDL in the range of 160 – 189 mg/dL, and 4 (2.1%) had LDL greater than 190 mg/dL. LDL level was significantly higher in women ($P<0.05$). A positive correlation between LDL levels and BMI was found. But there was not any significant correlation between LDL level and age and smoking. Seventy-seven (38.9%) participants had HDL levels less than 40 mg/dL, 107 (54%) had HDL levels in the range of 40 – 59 mg/dL and 14 (7.1%) had HDL levels greater than 60 mg/dL. There was not a significant difference between HDL in men and women. No significant correlation was found between HDL level and age, smoking, and BMI.

Triglyceride

One hundred thirteen (57.1%) participants had triglyceride levels less than 150 mg/dL; 35 (17.7%) had triglycerides between 150 – 199 mg/dL, and 50 (25.2%) had triglycerides in the range of 200 – 499 mg/dL.

There was not a significant difference between triglyceride level in men and women. Triglyceride level did not have any significant correlation with smoking and BMI.

BMI

Twenty- two (11.1%) participants had BMI less than 18.5, 107 (54%) had BMI in the range of 18.5 – 24.9, 47 (23.7%) had BMI between 25 and 29.9, and 22 (11.1%) had BMI more than 30. The BMI was greater in women ($P<0.05$).

Cigarette and water pipe smoking

One hundred fifty-eight (79.9%) participants were smokers. Of them 29 **(**14.6%) were only cigarette smokers, 51 (25.8%) used water pipe, and 76 (38.4%) smoked water pipe or cigarette upon availability and occasion. Two (1%) participants consumed both simultaneously, and 40 (20.2%) individuals never smoked cigarette or water pipe.

Absolute risk

Eighty-five (42.9%) participants had less than 1% chance of coronary events in next ten years, 79 (40%) had intermediate risk in the range of 1 – 10%, and 34 (17.1%) had high risk of coronary events (>10%).

The 10-year chance of coronary events was higher in men than women (Table 1, $P<0.05$).

Discussion

Since several men worked out of home following their herd, most of our study population were women**.** Abnormalities of lipid profile in our population were relatively high in comparison with Iranian urban population.[7] High LDL is reported as the primary atherogenic factor, and controlled clinical trials show that lowering LDL reduces the risk of coronary heart disease (CHD).[8] Accordingly, LDL cholesterol is defined as the primary target of lipid-lowering therapy.[8]

About 80% of our population were smokers. A strong dose-responsive relationship is present between cigarette smoking and CHD in both sexes, in the young and elderly, and in all racial groups.[9] Cigarette smoking increases the risk of CHD two to three times and interacts with other risk factors to multiple the risk.[9] The extremely high rate of smoking in our study population is alarming, and immediate strategies should be taken to prevent the secondary cardiovascular effects of smoking.

The prevalence of hypertension in our population was higher than the Iranian urban population.[7] Both systolic and diastolic hypertension were shown to have a strong, positive, continuous, and graded relationship with CHD without any evidence of a threshold risk level of BP.[3] Among populations, the relative risk for CHD imposed by a given increase in BP is similar, but the absolute risk at a given BP varies substantially.[11] It may be due to clustering of hypertension with insulin resistance, hyper-insulinemia, glucose intolerance, dyslipidemia, left ventricular hypertrophy, and obesity.[12] Hypertension occurs in isolation in 20% of individuals.[12]

The prevalence of DM in our population was relatively low compared with Iranian urban population.[7] CHD is the leading cause of death among diabetics and approximately 25% of survivors of myocardial infarction have DM.[7]

Obesity is defined by American Heart Association as a major risk factor for CHD.[10]

Table 1. Ten-year risk of coronary events in men compared to women.

Gender/ Risk	Male	Female
<1%	23.28%	54.4%
1 – 10%	45.19%	36.8%
>10%	31.49%	8.8%

Obesity promotes insulin resistance, hyperinsulinism, type 2 DM, hypertension, hypertriglyceridemia, low HDL cholesterol, small dense LDL, prothrombic factors, and left ventricular hypertrophy.[3] It is associated with an increase in cardiovascular and all-cause mortalities.[3] The prevalence of obesity in our study population was significant in comparison with urban people.[7]

Of our study population, 57.1% had intermediate and high risk of coronary events. According to NCEP-ATP III, patients at high risk deserve aggressive treatment for risk-reduction. Those at intermediate risk deserve an effective and safe medical intervention and low-risk patients are encouraged to follow public health recommendations for primary prevention of CHD.[8]

The prevalence of conventional risk factors for CAD in Lor migrating tribes is very high in comparison with people living in Tehran. Westernization of Iranian diet and sedentary lifestyle even in rural areas may play an important role. A national prevention program should be implemented as soon as possible to prevent the expected epidemics of CAD. Measures are needed to change the lifestyle especially for smoking abstinence to address the management of the metabolic syndromes and to reduce modifiable risk factors for CAD.

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