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Prevalence of Major Cardiovascular Risk Factors among Adults in Albania

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Abstract: ***Background: Approximately 80% of cardiovascular disease (CVD) can be explained by smoking, hypertension, and deterioration of lipid and glucose metabolism. The aim of this study is to determine the spread of cardiovascular risk factors in a sample from the Albanian population. Methodology: 632 persons were randomly selected: consisting of 443 females and 189 males. The inclusion criteria were males and females above 18 years old. The selection was random, one person per house, stratified by address, gender and age group. We registered the conventional risk factors for coronary heart disease such as smoking, alcohol, hypertension, diabetes mellitus etc. as well as sociodemographic and socioeconomic characteristics. Results: 632 persons were included in this survey, consisting of 189 (29.9%) males and 443 (70.1%) females. The average age in males was 43.90±15.57 years old, whereas in females it was 38.54±12.51. The prevalence of hypertension in this population is16.10%, and males have slightly higher prevalence than females but without a statistically significant difference, 20.4% vs. 14.2% respectively (p=0.015). The prevalence of smoking was 20.3%, and males smoke more than women, 33.5% vs. 14.7% respectively (p<0.001). About 46.1% of males and 39.9% of females have high cholesterol ≥ 200 mg/dL (p=0.231) and the prevalence of diabetes mellitus was 4.6%, being higher in males than in females, 9.1% vs 2.7% respectively (p=0.001). Conclusion: There is a high prevalence of cardiovascular risk factors in our population. Thus, a considerable percentage of the Albanian population has a "high risk" for future cardiovascular events.***

Keywords: CVD risk factors, prevalence, smoking, hypertension, dyslipidemia, diabetes mellitus

1. Introduction

Cardiovascular disease (CVD) remains the most important cause of death worldwide. More than 17million people died from CVD in 2008, and 10% of the global disease burden, as measured in disability-adjusted life-years, is attributed to CVD. More than 3 million of these deaths occurred in people below the age of 60 and could have largely been prevented[1]. The percentage of premature deaths from CVD ranges from 4% in high-income countries to 42% inlow-income countries, and there are growing inequalities in the occurrence and outcome ofCVD between countries and social classes. Over recent decades, CVD deaths have been declining in high-income countries, but have been increasing rapidly in low- and middle-income countries.

The epidemic of cardiovascular disease (CVD) in the twentieth century prompted many population-based surveys. Now, a huge number of epidemiological studies provide a clear picture of the risk for CVD. Approximately 80% of CVD can be explained by smoking[2-5], high blood pressure[6, 7], and deterioration of lipid and glucose metabolism[8, 9], the two latter being mediated through an unhealthy diet (high intake of salt, saturated fat, and refined sugar)and physical inactivity[10, 11]. A causal web for CVD shows that the influence is seen throughout the life course, and that „upstream" factors like socioeconomic status, health policies, and industrial influences all have a powerful impact on the more downstream parameters like lifestyle and biomarkers. This emphasizes that population-level interventions represent the most effective options for future strategies for the prevention of CVD[12].

Albania represents some peculiarities regarding its epidemiologic profile. While its mortality models resemble those of developed European countries, its morbidity models resemble those of developing countries[13].

2. Objective

To determine the spread of cardiovascular risk factors such as hypertension, smoking, blood lipids and glucose in a sample from the Albanian population.

3. Methodology

For this study we used the data from the international project: "National study on nutrition habits and prevalence of the cardiovascular risk factors in the Albanian population". The inclusion criteria were males and females over 18 years old. The sample selection was random, one person per house stratified by address, gender and age group. We took blood tests of fasting patients: total cholesterol, triglycerides (TG), Low Density Lipoproteins Cholesterol (LDL-cholesterol), High Density Lipoproteins Cholesterol (HDL-cholesterol) and glucose.

All the participants had to fill in a form which included socio-demographic and socio-economic characteristics such as age, gender, education, job, economic level, social stratum and religion. The socio-economic level was determined based on the actual professional status; education level categorized as primary, high and higher education; actual marital status; and economic status categorized into 2 levels: category A – mean monthly income of the last 3 years < 20.000 ALL (~143 EUR) – and category B – mean monthly income of the last 3 years > 20.000 ALL.

We also registered the conventional risk factors for ischemic heart disease such as smoking, alcohol, sedentary life, hypertension, diabetes, family history of ischemic heart disease and anthropometric indices. Dyslipidemia was defined according to the ATP III criteria: High Total Cholesterol (TC) ≥ 200 mg/dL, high LDL-cholesterol (LDL-C) ≥ 130 mg/dL, low HDL-cholesterol (HDL-C) ≤ 40 mg/dL, Hypertriglyceridemia (TG) ≥ 150 mg/dL.

Individuals were classified as hypertensive when systolic blood pressure was higher than 140 mm Hg and/or diastolic blood pressure was higher than 90 mm Hg. Hypertension was defined according to hypertension guidelines[5]. Blood Systolic (mm Hg)/Diastolic (mm Hg) pressure was categorized as Normal 120-129/80-84; High Normal 130-139/85-89; and Hypertension stages: Stage 1 – mildly elevated 140-159/90-99; Stage 2 – moderately elevated 160-179/100-109; Stage 3 – highly elevated 180+/110+. Also, following international recommendations, the interviewees were considered hypertensive even when they had normal or optimal blood pressure, but were taking anti-hypertensive medications.

4. Statistical Analysis

The data were presented in absolute values and in percentage. The Chi-square test was used to evaluate differences among groups. Random associations among variables were analyzed through binary logistic regression. Whereas the Kolmogorov-Smirnov test was used to evaluate differences within the groups. The statistical analysis was made with the SPSS 19.0 software.

5. Results

This study included 632 persons, which consisted of 189 (29.9%) males and 443 (70.1%) females. The average age of males was 43.90±15.57 years old, whereas that of females was 38.54±12.51 years old. Table 1 presents the spread of socio-demographic characteristics according to gender. There were no statistically significant differences between males and females regarding education, marital status and economic situation. As regards education, about half of the participants had higher education degrees.

Table 1: Socio-demographic characteristics according to gender

General characteristics		Gender		Total n=632 (%)	p value
		M n=189 (%)	F n=443 (%)		
Education	primary	12 (6.4)	37 (8.4)	49 (7.8)	0.901
	high	56 (29.6)	127 (28.7)	183 (29.0)	
	higher	85 (45.0)	196 (44.2)	281 (44.5)	
	elementary	1 (0.5)	2 (0.5)	3 (0.5)	
	not reported	35 (18.5)	81 (18.3)	116 (18.4)	
Marital status	single	54 (28.6)	133 (30.0)	187 (29.6)	0.505
	divorced	1 (0.5)	8 (1.8)	9 (1.4)	
	window	3 (1.6)	10(2.3)	13 (2.1)	
	married	116(61.4)	257 (58.0)	373 (59.0)	
		15 (7.9)	35 (7.9)	50 (7.9)	
Economic status	A (<20.000 ALL)	33 (17.5)	132 (29.8)	165 (26.1)	0.007
	B(<20.000 ALL)	122 (64.6)	242 (54.6)	364 (57.6)	
		34 (18.0)	69 (15.6)	103 (16.3)	
Religion	Bektashi	13 (6.9)	25 (5.6)	38 (6.0)	0.952
	Catholic	16 (8.5)	34 (7.7)	50 (7.9)	
	Muslim	103(54.5)	255 (57.6)	358 (56.6)	
	Orthodox	32 (16.9)	80 (18.1)	112 (17.7)	
	Other	25 (13.2)	49 (11.1)	74 (11.7)	

As regards the economic status of the participants, there was a statistically significant difference between categories: Category A (mean monthly income of the last 3 years < 20.000 ALL) was 26.7% whereas Category B (mean monthly income of the last 3 years > 20.000 ALL) was 58.8% (p<0.001).

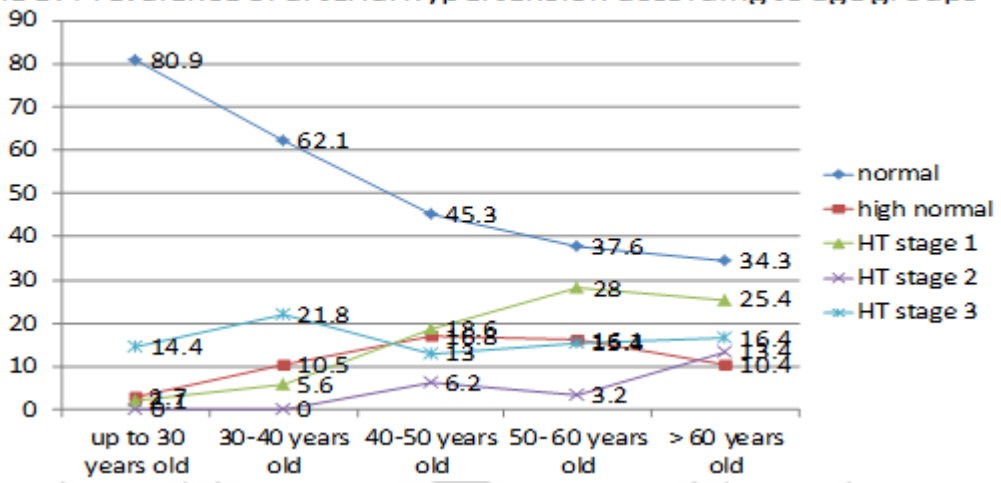
Clinical and biochemical data

The mean systolic blood pressure was 123.9 mm Hg in males and 120.03 mm Hg in females and there was no statistically significant difference between genders; whereas the mean arterial diastolic pressure was higher in females than in males, 81.17 mm Hg vs. 77.53 mm Hg respectively (p<0.01) (Table 2). The prevalence of hypertension in this population was 16.10%, and males have a slightly higher prevalence than females but without a statistically significant difference, 20.40% vs. 14.20% respectively (p=0.015). One every four persons reported having family history for hypertension. The prevalence of hypertension increases proportionally with age (Table 3). Thus, the percentage of normal blood pressure decreases with increasing age, in accordance with the increasing prevalence of hypertension (hypertension stage 1, 2 and 3) with increasing age.

Table 2: Clinical characteristics of participants according to gender

Variables	Gender		p value
	M n=189 (%)	F n=443 (%)	
Age (years)	43.90±15.57	38.54±12.51	<0.001
SBP	123.912±16.35	120.03±19.77	0.028
DBP	81.17±8.79	77.53±11.16	<0.001
Glucose	82.88±14.5	85.43±15.56	0.269
Total Cholesterol	197.24±12.41	202.33±10.03	0.231
HDL-cholesterol	48.59±7.98	48.48±7, 12	0.911
LDL-cholesterol	119, 39±11, 4	122.51±7, 74	0.362
TG	116, 63±8.98	120.45±9.76	0.216
BMI	26.69±4.10	24.94±5.34	<0.001
Waist circumference (cm)	94.37±15.41	78.85±16.03	<0.001
Hip circumference (cm)	102.89±9.98	100.07±10.28	0.008

Table 3. Prevalence of arterial hypertension according to age groups



The prevalence of smoking is 20.30%, and males smoke more than females, 33.50% vs. 14.7% respectively (p<0.001) (Table 4). As regards the demographic characteristics, there is a statistically significant difference between smokers and non-smokers regarding gender (p<0.001), whereas there are no statistically significant differences regarding education, marital status, economic status, religion and age groups.

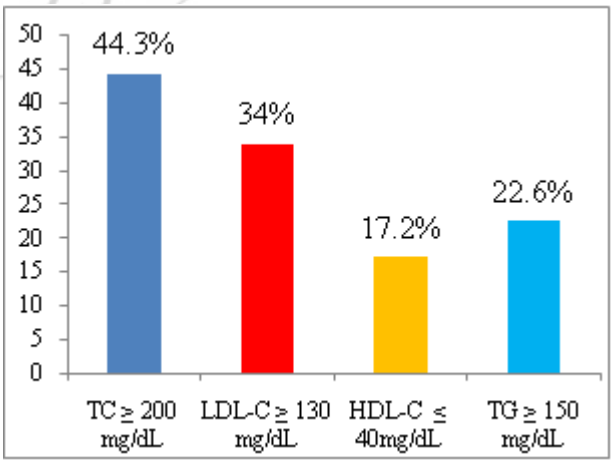
Table 4: Prevalence of cardiovascular risk factors according to gender

Risk factor	*Gender*		*Total (n=632*	*p value*
	M (n=189)	*F (n=443)*		
Actual smoker	61 (32.3)	63 (14.2)	124 (19.6)	<0.001
Alcohol	131 (69.3)	186 (42.0)	317 (50.2)	<0.001
HTN	38 (20.1)	63 (14.2)	101 (16.0)	0.015
Family history for HTN	51 (27.0)	122 (27.5)	173 (27.4)	0.837
Diabetes Mellitus (DM)	17 (9.1)	12 (2.7)	29 (4.6)	0.001
Family history for DM	25 (13.2)	52 (11.7)	77 (12.2)	0.629
Diet	29 (15.3)	68 (15.3)	97 (15.3	0.925

Total cholesterol was 197.24 mg/dL in males and 202.33 mg/dL in females (p=0.231); LDL-cholesterol was 119.30 mg/dL in males and 122 mg/dL in females (p=0.362). HDL-cholesterol was 48.59 mg/dL in males and 48.48 mg/dL in females (p=0.911). TG was 116.63mg/dL in males and 120 mg/dL in females (p=0.215).

The prevalence of dyslipidemia in our population was 58.6%. Total hypercholesterolemia (TC ≥200mg/dL) was high, being present in 44.3% of the population, and women have a higher prevalence than men but without any statistically significant difference, 46.1% vs.39.9% respectively (p= 0.231). The prevalence of LDL-C (≥130 mg/dL), HDL-C (≤40 mg/dL) and TG (≥150 mg/dL), was 34%, 17.2%, 22.6% respectively (Table 5).

Table 5: Prevalence of dyslipidemia according to ATP III criteria



There was no statistically significant difference in blood glucose according to gender. Blood glucose was 82.8 mg/dL in males and 85 mg/dL in females (p=0.269). The

prevalence of diabetes was 4.6% and it was higher in males than females, 9.1% vs. 2.7% respectively (p=0.269).

At the same time, males had a higher body mass index than females, 26.69±4.10 vs.24.94±5.34 respectively (p <0.001). Males had a higher waist circumference than females, 94.37±15.41 vs.78.85±16.03 respectively (p<0.001), whereas there was no statistically significant difference regarding hip circumference (p=0.008). About half of the population drinks alcohol, with 3 every 4 males and 2 every 5 females answering "Yes" to the question regarding alcohol use.

6. Discussion

The mean systolic blood pressure was 123.9 mm Hg in males and 120.03 mm Hg in females and there was no statistically significant difference between genders, whereas the mean diastolic blood pressure was higher in women than in men, 81.17 mm Hg vs. 77.53 mm Hg respectively (p<0.01). In spite of these measurements, a high percentage of participants had high values of both systolic and diastolic blood pressure. The prevalence of hypertension in this population was 16.10%, and males had a slightly higher prevalence than females but without any statistically significant difference, 20.40% vs. 14.20% respectively (p=0.015). These values are similar to the other studies conducted with the Albanian population[14]. This study also confirmed that hypertension is proportional to age even in this population.

The prevalence of smoking was 20.30%, and males smoke more than females, 33.50% vs. 14.7% respectively (p<0.001). These results are similar to a study conducted in 2003-2006 in which the prevalence of smoking in the normal population was 34.4% in males and 13.7% in females[15]. In all the European countries (except for Sweden), the prevalence of smoking is higher in males than in females. This difference is more noticeable in Eastern European countries than in Western Europe[16].
The prevalence of dyslipidemia in our population was 58.6%, which is similar to the other European countries. Thus, we can speculate that about 1.4 million Albanians have at least one of the high dyslipidemia risk factors. Total hypercholesterolemia (TC ≥200mg/dl) is high, in 44.3% of the population, and females have a higher prevalence than males, but no statisticially significant difference, 46.1% vs.39.9% respectively (p=0.231).The prevalence of LDL-C (≥130 mg/dl), HDL-C (≤40 mg/dl) and TG (≥150 mg/dl) were 34%, 17.2% and 22.6% respectively. Dyslipidemia is not associated to age groups, BMI, education and family income, but it is associated to fasting blood glucose.

The mean blood glucose was 82.8 mg/dL in males and 85 mg/dL in females (p=0.269), without statistically significant difference (p=0.269). The prevalence of diabetes was 4.6%, and it was higher in males than in females, 9.1% vs. 2.7% respectively (p=0.001), which are similar to the results of other studies[17].

7. Conclusion

The objective of this study was to describe the situation of cardiovascular risk factors in a representing sample of the Albanian population. The level of these risk factors is high. However, the association among these factors remains unknown, as well as their relation to the lifestyle and behavior of the participants. Thus, future studies might provide better information regarding the role of these factors in the incidence of ischemic heart disease.

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