Prevalence and associated factors of hypertension: results from a three community-based survey, Jordan

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The aim of this study was to estimate the prevalence of hypertension, to determine its association with certain cardiovascular disease risk factors, and to evaluate level of hypertension awareness and control in an adult population in Jordan. The study used a cross-sectional population survey of a systematic sample of three communities. Data for the sample of 2299 adults, aged 25 years and older, were collected from September 1994 to September 1995. A total of 370 subjects or 16.1% were found to have hypertension. The prevalence rate was higher among women (17.1%) than men (14.4%). Logistic regression analysis indicated that hypertension was positively associated with gender, age, family history of hypertension, diabetes mellitus, and total serum cholesterol, but negatively associated with level of education. No association between hypertension and smoking was detected in this study. About one-half (48.6%) of hypertensives in this study were unaware of their diagnosis. Awareness of hypertension was positively associated with age and family history. More than one-third (36.5%) of those aware of their diagnosis did not achieve control of their hypertension. Hypertension appears to be a common public health problem in Jordan. Awareness and control of hypertension are far below optimal levels.

Keywords: diabetes; cholesterol; obesity; family; smoking; prevalence; survey; Jordan

Introduction

Systematic hypertension is a major public health problem worldwide and represents one of the most common problems in clinical medicine. The report of the 1988 Joint National Committee[1] indicates that about 58 million Americans have high blood pressure (BP) (systolic BP [SBP] of ≥140 mm Hg, diastolic BP [DBP] of ≥90 mm Hg and/or are on antihypertensive medication). Based on the findings of many community surveys,[2–10] prevalance rates of hypertension range from 2.6–59%. These variations are due mainly to differences in the demographic structure of study populations, geographical location, and study designs. In the Middle East, reliable data on hypertension are scarce at best or completely absent in many countries. Based on the few available reports from the region, the prevalence of hypertension is in the range of 1.4–11.1%.[11–13] However, results from a recent national population survey[14] in Egypt indicates that 26.3% of Egyptians 25 years of age and older have hypertension (SBP >140, DBP >90, and/or are on antihypertensive medication).

Despite the fact that the majority of hypertensive individuals are asymptomatic, chronic hypertension can lead to significant complications such as congestive heart failure, myocardial infarction, cerebrovascular accident, and/or renal insufficiency.[15,16] Many such undesirable complications of this disease can be prevented if hypertension is detected and adequately controlled.

Development of hypertension may be related to many factors. Age, body weight, and racial and familial differences in BP levels have been reported, with levels being higher among older than younger age groups,[15–18] higher among blacks than whites,[5,15,16] higher among groups with a positive family history of hypertension than their counterparts,[15,16,19–21] and higher among obese than non-obese individuals.[18,22–24] Several,[2,6,15] but not all,[3,4,7,8,23] studies have reported a higher prevalence rate of hypertension among men than women.

Jordan is one of the countries where data on this health problem and its associated factors are completely absent. Assessment of the magnitude of distribution of hypertension, associated risk factors, and the extent of hypertension awareness and control among population subgroups should be the first step toward the development of more effective hypertension detection and control programmes. This study was conducted to provide such needed information and to establish a baseline profile of hypertension, in addition to other cardiovascular disease (CVD) risk factors.

Subjects and methods

The survey was conducted to estimate prevalence rates of CVD risk factors, such as diabetes mellitus

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(DM), hypertension, smoking, hypercholesterolemia, and hypertriglyceridemia, in three semi-urban communities from September 1994 to September 1995.

The town of Sareeh was selected from the north, Sikhra from the middle, and Southern Mazar from the south of Jordan. The towns are comparable in size and are within 10 km from a big city. The middle and southern towns are about 1000 m above sea level while the northern town is about 600 m above sea level. The people of the three towns are all Arabs, share common cultural and lifestyle characteristics, and public service and agriculture are their main sources of income. However, all the population of the middle town belong to one tribe, compared to several tribes live in the other two towns.

All residents of the three communities 25 years of age and older were eligible for inclusion in the study. In each community a systematic sample of the households was selected and visited by two members of the team. After registration of names of eligible persons, home phones and addresses, the team explained the study and its procedures, and handed them a written invitation showing the date and time to report to the town health care centre. To encourage participation a person was given a choice of reporting on the given date or any day during the 4-week study period, and was offered free transportation. The invitation and the team stressed the need for an overnight fast before obtaining the blood samples. A structured and pilot-tested interview questionnaire was used to collect information and specific history on DM, hypertension, hyperlipidemia, and smoking behaviour. Measurements of height, weight, BP, blood sugar levels (both fasting and 2-h post 75 g oral glucose loading), total serum cholesterol (TSC), and triglycerides were also obtained on each subject upon his/her visit to the health care centre. BP was measured using standardized sphygmomanometers with a 12–12.5 cm cuff to cover two-thirds of the upper arm. A physician or a trained nurse performed the procedure while the subject was in a sitting position with the arm at the level of the heart and after 5 min rest. The cuff was deflated at a rate of 2–3 mm Hg per second. SBP was taken upon hearing the first sound while DBP was taken upon complete disappearance of Korotkoff sounds (Phase V). Body mass index (BMI) was calculated by dividing the weight in kilograms (kg) by height in meters squared (m^2). A BMI of 30 was used as the cutoff point to differentiate obese and non-obese subjects.

Hypertension is defined as an SBP of ≥160 mm Hg, DBP of ≥95 mm Hg, or use of antihypertensive medication. DM is defined as a fasting plasma glucose level of ≥140 mg/dl, 2-h postprandial plasma glucose level of ≥200 mg/dl, or positive history of DM. High TSC is defined as a total serum cholesterol level of ≥250 mg/dl.

Statistical analysis

Descriptive and bivariate analyses were performed using the Statistical Package for Social Sciencies Personal Computer (SPSSPC). Multiple logis regression analyses were performed to test for t independent effect of selected risk factors on hyp tension. The odds ratio was the antilogarithm of t regression coefficient of an indicator term that cor sponded to a certain level of the independent va able. The 95% confidence interval was calculat using the standard error of the regression coefficie

Results

A total of 2299 subjects participated in the stuc The overall participation rate was 61.7% (62% Sareeh, 78% in Sikhra, and 45% in Southe Mazar).

As shown in Table 1, women accounted for mo than 60% of the sample. The 60-year and older a group accounted for 19.2% and were overrepre ented in the sample compared to a distribution 4.3% in the population.[25] The dominance of wom and elderly in the study sample is due to higher pa ticipation rates among these groups. Uneducat individuals and individuals with less than hi school diploma comprised 33.5% and 37.2% of t sample. The majority of subjects (81.3%) were ma ried, and more than 80% of the sample had eith public or private insurance or both.

The current smoking rate was relatively lo (14.6%) (31.5% men, 4.8% women and that of frai diabetes was 13.6% (14.8% men, 12.9% women). positive family history for hypertension and obesi was reported by 47.9% and 43.0% of the sampl

Table 1 Distribution of the study population based on socioder ographic variables

Variable	*n (%)*
Sex	
M	846 (36.8)
F	1453 (63.2)
Total	2299
Age (yr)	
25–29	414 (18.1)
30–39	516 (22.6)
40–49	464 (20.3)
50–59	449 (19.7)
60+	438 (19.2)
Total	2281
Eduction	
Uneducated	769 (33.5)
<High school	853 (37.2)
≥High school	674 (29.3)
Total	2296
Family history of hypertension	
Absent	964 (52.1)
Present	885 (47.9)
Total	1849
BMI (kg/m^2)	
<30	1305 (57.0)
≥30	985 (43.0)
Total	2290
Smoking (current smoker)	
Yes	335 (14.6)
No	1952 (85.4)
Total	2287

respectively. Obesity was more prevalent among women (53.9%) than men (24.3%).

Table 2 shows that the prevalence rate of hypertension in this study was 16.1%. The mean SBP and DBP were 123/79 mm Hg (121/79 mm Hg for men and 123/79 mm Hg for women). The prevalence rate differed by study location; it was most common in Sikhra (18.5%) compared to Sarih (12.9%) and Southern Mazar (15.7%). Differences by study location were statistically significant ($P = 0.01$). Women had a higher rate of hypertension (17.1%) than men (14.4%); however, the difference by gender was not statistically significant ($P = 0.09$).

Table 2 Distribution of rates of previously diagnosed (PDH), previously undiagnosed (PUDH), and overall hypertension by study variables

Variable	*PDH n (%)*	*PUDH n (%)*	*Total n (%)*
Sex			
M	59 (7.0)	62 (7.4)	121 (14.4)
F	131 (9.0)	118 (8.1)	249 (17.1)
Total	190 (8.3)	180 (7.8)	370 (16.1)
P-value	0.10	0.56	0.09
Age (yr)			
25–29	3 (0.7)	10 (2.4)	13 (3.1)
30–39	8 (1.6)	22 (4.3)	30 (5.9)
40–49	36 (7.8)	31 (6.7)	67 (14.5)
50–59	63 (14.0)	49 (10.9)	112 (24.9)
60+	77 (17.6)	61 (14.0)	138 (31.6)
Total	187 (8.2)	173 (7.6)	360 (15.8)
P-value	0.00	0.00	0.00
Marital status			
Single	3 (1.4)	11 (5.0)	14 (6.4)
Married	157 (8.4)	137 (7.4)	294 (15.8)
Widowed or divorced	30 (14.4)	31 (14.9)	61 (29.3)
Total	190 (8.3)	179 (7.8)	369 (16.1)
P-value	0.00	0.00	0.00
Education			
Uneducated	121 (15.7)	99 (12.9)	220 (28.6)
<High school	51 (6.0)	63 (7.4)	114 (13.4)
≥High school	17 (2.5)	18 (2.7)	35 (5.2)
Total	189 (8.2)	180 (7.9)	369 (16.1)
P-value	0.00	0.00	0.00
Health insurance			
Absent	23 (6.9)	20 (6.0)	43 (12.9)
Present	167 (8.5)	160 (8.2)	327 (16.7)
Total	190 (8.3)	180 (7.8)	370 (16.1)
P-value	0.38	0.21	0.10
Current smoker			
No	173 (8.9)	163 (8.4)	336 (17.3)
Yes	16 (4.8)	16 (4.8)	32 (9.6)
Total	189 (8.2)	179 (7.8)	368 (16.1)
P-value	0.02	0.03	0.00
BMI			
<30	67 (5.1)	65 (5.0)	132 (10.1)
≥30	122 (12.4)	114 (11.6)	236 (24.0)
Total	189 (8.2)	179 (7.8)	368 (16.1)
P-value	0.00	0.00	0.00
Family history of hypertension			
Absent	102 (11.5)	61 (6.9)	163 (18.4)
Present	53 (5.5)	77 (8.0)	130 (13.0)
Total	155 (8.4)	138 (7.5)	293 (15.9)
P-value	0.00	0.42	0.01
Diabetes Mellitis			
Absent	136 (6.9)	143 (7.2)	279 (14.1)
Present	53 (17.0)	35 (11.3)	88 (28.3)
Total	189 (8.3)	178 (7.8)	367 (16.0)
P-value	0.00	0.02	0.00
Location			
Sarih	56 (8.0)	34 (4.9)	90 (12.9)
Sikhra	89 (8.4)	107 (10.1)	196 (18.5)
Southern Mazar	45 (8.4)	39 (7.3)	88 (15.7)
Total	190 (8.3)	180 (7.8)	370 (16.1)
P-value	0.78	0.00	0.00

As expected, prevalence rates of hypertension increased with age. Subjects 60 years of age and older had the highest rate (31.6%) of hypertension, whereas the lowest rate of hypertension was found in the 25–30 year age group (3.1%). This age-related trend was statistically significant ($P = 0.00$).

With respect to marital status, widowed or divorced subjects had a higher rate of hypertension (29.3%) than married (15.8%) and single subjects (6.4%). This difference was statistically significant ($P = 0.00$).

The uneducated group had a higher rate of hypertension (28.6%) than those with less than a high school diploma (13.4%) and those with a higher school diploma or more (5.2%). This difference was statistically significant ($P = 0.00$).

Contrary to our expectations, it appeared that nonsmokers had a significantly higher prevalence rate of hypertension (17.2%) than current smokers (9.6%) ($P = 0.00$). The population group with a BMI of $\geq 30\ kg/m^2$ appeared to have higher rates of hypertension (24.0%) than those with a BMI of $<30\ kg/m^2$ (10.1%). This difference was statistically significant ($P = 0.00$).

Subjects with a positive family history of hypertension had a significantly higher rate of hypertension (18.4%) than their counterparts (13.5%) ($P = 0.00$). Diabetics had a higher rate of hypertension (28.3%) than non-diabetics (14.1%). This difference was statistically significant ($P = 0.00$).

Similarly, subjects with a high TSC had a significantly higher prevalence rate of hypertension (21.3%) than subjects with normal TSC levels (14.3%) ($P = 0.00$). Logistic regression analysis was performed to test for the independent effect of study site, gender, age, BMI, education level, family history, DM, and TSC on hypertension. As shown in Table 3, the association between hypertension and the variables of gender, age, level of education, family history of hypertension, BMI, DM, and TSC was highly significant, but no association was found between hypertension and smoking. The risk for hypertension was 1.5 times higher in women than in men. Compared to the 25–30 year age group, the risk for hypertension increased by 1.9 times in the 40–49 year age group, 2.8 times in the 50–59 year age group, and 3.8 times in the age group 60 years and older. Uneducated subjects were 2.8 times more likely to develop hypertension compared to subjects with a high school diploma or more. Subjects with a positive family history of hypertension were 1.8 times more likely to be hypertensive than those with no family history of hypertension. Subjects with a BMI of $\geq 30\ kg/m^2$ were at a higher risk of developing hypertension (odds ratio = 2.2) than their counterparts. Diabetics were 1.6 times more likely to develop hypertension than non-diabetics, and subjects with a high TSC were 1.4 times more likely to develop hypertension than subjects with normal TSC levels.

Table 3 Adjusted[a] odds ratio (OR) of prevalence of hypertension by selected variables

Variable	OR	95% CI[b]	P-value
Sex			
M	1.0		
F	0.7	0.5, 1.0	0.05
Age (yr)			
25–29	1.0		
30–39	1.0	0.5, 2.0	0.93
40–49	2.0	1.1, 3.7	0.03
50–59	3.0	1.5, 5.6	0.00
60+	4.0	2.0, 7.7	0.00
Education			
Uneducated	2.7	1.6, 4.8	0.00
<High school	1.4	0.9, 2.3	0.15
≥High school	1.0		
Family history of hypertension			
Absent	1.0		
Present	1.7	1.3, 2.2	0.00
BMI (kg/m²)			
<30	1.0		
≥30	2.2	1.6, 3.0	0.00
DM			
Absent	1.0		
Present	1.5	1.1, 2.1	0.02
Smoking			
No	1.0		
Yes	0.7	0.5, 1.2	0.21
TSC (mmol/L)			
<6.6	1.0		
≥6.6	1.7	1.2, 2.3	0.00
Location			
Sarih	1.0		
Southern Mazar	1.2	0.8, 1.8	0.37
Sikhra	1.8	1.3, 2.6	0.00

[a]Using multiple logistic regression analysis.
[b]CI = confidence interval.

Rates of awareness and control of hypertension

In this study, the prevalence rate of previously diagnosed hypertension (PDH) (8.3%) was slightly higher than that of previously undiagnosed hypertension (PUDH) (7.8%). Further analysis of data was performed only on hypertensive subjects to test for significant differences between those previously diagnosed and previously undiagnosed by study variables. As shown in Table 4, the level of awareness of hypertension was highest in Sarih (62.2%) and lowest in Sikhra (45.4%). This difference by study location was statistically significant ($P = 0.01$). As expected, the level of awareness of hypertension increases with age. The 40-year and older age group had a higher rate of PDH (55.5%) than the below 40-year age group (25.6%) ($P = 0.00$). Similarly, the level of awareness of hypertension in subjects with a family history of hypertension (62.6%) was significantly higher than in subjects with no family history of hypertension (40.8%) ($P = 0.00$). Diabetics appeared to be more aware of their hypertension status than nondiabetics (60.2% *vs* 48.7%, respectively). This difference in awareness was not statistically significant ($P = 0.08$). The level of awareness of hypertension, however, was not associated with gender ($P = 0.56$), marital stauts ($P = 0.50$), level of education ($P = 0.15$), or health insurance coverage ($P = 0.89$).

Table 4 Rate of awareness of hypertension by sociodemographic and health variables

Variable	PDH[a]		PUDH[b]		P-value
	n	(%)	n	(%)	
Sex					
M	59	(48.8)	62	(51.2)	
F	131	(52.6)	118	(47.4)	0.56
Total	190	(51.4)	180	(48.6)	
Age (yr)					
<40	11	(25.6)	32	(74.4)	
≥40	176	(55.5)	141	(44.5)	0.00
Total	187	(51.9)	173	(48.1)	
Education					
Uneducated	121	(55.0)	99	(45.0)	
<High school	51	(44.7)	63	(55.3)	
≥High school	17	(48.6)	18	(51.4)	0.15
Total	189	(51.2)	180	(48.8)	
Family history of hypertension					
Absent	53	(40.8)	77	(59.2)	
Present	102	(62.6)	61	(37.4)	0.00
Total	155	(52.9)	138	(47.1)	
Location					
Sarih	56	(62.2)	34	(37.8)	
Southern Mazar	45	(53.6)	39	(46.4)	
Sikhra	89	(45.4)	107	(54.6)	0.01
Total	190	(51.4)	180	(48.6)	

[a]PDH = Previously diagnosed hypertension.
[b]PUDH = Previously undiagnosed hypertension.

Results of logistic regression analysis (Table 5) indicate that study location, age, and family history were independently associated with PDH, after controlling the effects of these and other selected variables ($P = 0.02$, 0.00, and 0.00, respectively).

Furthermore, analysis of data indicates that 36.3% of subjects with PDH still had uncontrolled hypertension (BP of ≥160/95 mm Hg) at the time of the

Table 5 Adjusted[a] odds ratio (OR) of previously diagnosed hypertension (PDH) by selected study variables

Variable	OR	95% CI[b]	P-value
Sex			
M	1.0		
F	1.2	0.6, 2.2	0.68
Age (yr)			
<40	1.0		
≥40	1.1	1.0, 1.1	0.01
Education			
Illiterate	1.4	0.5, 4.2	0.55
<High school	1.0	0.4, 2.5	0.06
≥High school	1.0		
Family history of hypertension			
Absent	1.0		
Present	3.5	2.0, 6.1	0.00
Location			
Sarih	1.0		
Southern Mazar	0.63	0.3, 1.3	0.21
Sikhra	0.38	0.2, 0.7	0.00

[a]Using multiple logistic regression analysis.
[b]CI = confidence interval.

study. As shown in Table 6, control of hypertension was not associated with gender ($P = 0.74$), age ($P = 0.72$), or family history ($P = 0.39$) but with study location and BMI. Sikhra had the lowest rate of controlled hypertension (55.1%) compared to Sarih (71.4%) and Southern Mazar (70.5%). Difference in controlled hypertension by location was statistically significant ($P = 0.04$). Subjects with a BMI of <30 had a higher rate of controlled hypertension (76.1%) than those with a BMI of ≥30 (56.6%). This difference was statistically significant ($P = 0.01$).

Discussion

At the outset, a word of caution in interpreting the findings of this study is in order. The study design is limited by the fact that selection of communities was based on convenience. However, there is no reason to believe that semi-urban communities in Jordan are different from the study communities, since their population are of the same ethnic and demographic backgrounds, and share almost similar economic and cultural characteristics.

Our data showed that hypertension is a common health problem in Jordan, and the problem is more prominent in single–tribe communities such as Sikhra than in multiple–tribe communities such as Sarih. The prevalence rate of hypertension reported in this study is lower than in comparable age groups of populations in western countries.[4,5] Prevalence data on hypertension in Arab countries are scanty or nonexistent. The findings from a few studies in Saudi Arabia reported prevalence rates of hypertension that ranged from 1.4% to 11.1%[11–13] which are lower than that reported in this study. Differences in prevalence rates between the two countries are perhaps related to differences in study designs, study samples, case definition, and/or related to differences in lifestyle.

In our study, age was positively associated with hypertension, and the risk of disease dramatically increased after the age of 40 years. Women were at higher risk for hypertension than men even after adjusting for age and other potential confounders. This finding is consistent with those reported in several[3,4,7,8,23] but not all studies.[2,6,15]

Our data disclosed an inverse relationship between education level and hypertension. Illiteracy was significantly associated with a higher prevalence rate of hypertension, after adjusting for age, gender, and other potential risk factors. Reports of several studies indicate that low educational level is a major coronary risk factor.[26,27] In a study of a cohort of a rural population in India,[28] hypertension and coronary heart disease were more prevalent among uneducated and less educated groups than among more educated groups. People with a high educational status are perhaps more prone to adopt healthy lifestyle behaviour such as healthy diet, exercise, stress management, and weight control than people of low educational status.

A higher prevalence rate of hypertension among subjects with a positive family history of the disease, after adjusting for potential confounders, is consistent with the findings of other studies.[19,20] In a review article, Havlik[21] concluded that about one-third to one-half of the variability in BP is explained by heredity.

In agreement with results reported in the literature,[3,18,22,23] the obese group appeared to have an increased risk of hypertension over the non-obese group, after adjusting for age, gender, and other potential risk factors.

Consistent with the findings of other studies,[10,29] our data showed a significant positive association between DM and hypertension but the direction of the association remains to be explored, especially with type II diabetes. Steffes and Mauer[30] reported that hypertension in type I diabetes was a sequela mediated through diabetic nephropathy, while hypertension in patients with type II diabetes could be diagnosed shortly after or even before the diagnosis of DM.

The higher prevalence rate of hypertension among widows and divorced is due to age effect since age-controlled analysis showed no statistically significant difference between groups of this characteristic. Adjusted data also showed no statistically significant difference between smokers and non-smokers on hypertension.

Our study showed that about one-half of the hypertensive subjects in this study were not aware of their hypertensive status. There was no difference in the level of awareness based on gender or educational status. However, subjects 40 years of age and older, and hypertensives with a positive family history, were more likely to be aware of their hyper-

Table 6 Distribution of controlled (CH) and uncontrolled (UCH) hypertension in previously diagnosed hypertensive subjects by sociodemographic and health variables

Variable	CH		UCH		P-value
	n	(%)	n	(%)	
Sex					
M	39	(66.1)	20	(33.9)	0.73
F	81	(62.3)	49	(37.7)	
Total	120	(63.5)	69	(36.5)	
Age (yr)					
<40	10	(71.4)	4	(28.6)	0.72
≥40	110	(62.9)	65	(37.1)	
Total	120	(63.5)	69	(36.5)	
Education					
Uneducated	75	(62.5)	45	(37.5)	0.33
<High school	30	(58.8)	21	(41.2)	
≥High school	14	(82.4)	3	(17.6)	
Total	119	(63.3)	69	(36.7)	
BMI (kg/m²)					
<30	51	(76.1)	16	(23.9)	0.01
≥30	69	(56.6)	53	(43.4)	
Total	120	(63.5)	69	(36.5)	
Family history of hypertension					
Absent	36	(67.9)	17	(32.1)	0.39
Present	60	(59.4)	41	(40.6)	
Total	96	(62.3)	58	(37.7)	
Location					
Sarih	40	(71.4)	16	(28.6)	0.04
Southern Mazar	31	(70.5)	13	(29.5)	
Sikhra	49	(55.1)	40	(44.9)	
Total	120	(63.5)	69	(36.5)	

tensive status than their respective counterparts, after adjusting for gender, education, and location. Similarly, hypertensives in Sikhra were less likely to be aware of their diagnosis than those in Sarih and Southern Mazar. Moreover, more than one-third of hypertensive subjects who were on antihypertensive medications had uncontrolled hypertension at the time of the study. The prevalence rate of uncontrolled hypertension was significantly higher in obese subjects than in non-obese subjects, and higher in Sikhra than in the other two locations.

In conclusion, hypertension is clearly a common health problem in Jordan. Women, older age groups, uneducated subjects, diabetics, obese individuals, and those with a positive family history for hypertension were at higher risk of hypertension than their respective counterparts, after adjusting for potential risk factors. More than two-thirds of the hypertensive subjects in this study were either unaware of their hypertension or had uncontrolled hypertension, especially in Sikhra. This study highlights the need for health education programs geared toward raising public awareness of hypertension, for health promotion interventions, and for more efficient and effective hypertension detection and control programmes.

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Hyperlipidemia in Jordan: a community-based survey

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ABSTRACT

Background: Hyperlipidemia is a risk factor of cardiovascular disease. No data exists in Jordan regarding blood lipid level. **Objectives:** To determine the prevalence of high plasma cholesterol and triglyceride levels among three Jordanian communities and to identify high risk groups for these two conditions. **Design and methods:** A community-based survey of a sample of 2,152 persons aged 25 years or more selected from three locations in Jordan. Two blood samples, fasting and two hours after a 75 gm anhydrous glucose orally, were drawn from each participant. Plasma glucose, cholesterol, triglycerides, blood pressure, height and weight were measured and a pretested structured questionnaire was administered by a trained interviewer. The present report deals exclusively with the distribution of plasma levels of cholesterol and triglycerides. **Results:** The prevalence rates of hypercholesterolemia (HC) and hypertriglyceridemia (HT) were 23% and 23.8% respectively. Logistic regression analysis showed that age over 40 years, females, obese subjects and diabetic subjects were more likely to have HC. Males, current smokers, obese subjects and diabetic persons were at higher risk of HT. **Conclusions:** Hypercholesterolemia and HT are highly prevalent in Jordan with a pattern consistent with that of the United States and other developed countries. Dietary habits and lifestyle of the people have to be investigated and may provide an explanation for our findings.

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Cardiovascular diseases are the leading cause of death in many countries in the world including Jordan. Coronary heart disease is the most common single cause of death in the United States.[1] Hypercholesterolemia (HC) is a well-established major risk factor for coronary heart disease.[2-5] Lowering of total serum cholesterol was found to be associated with a reduction in coronary heart disease incidence. Data from the Lipid Research Clinics Program show that a 19% reduction of coronary artery disease incidence in cholestyramine-treated men was accompanied by a mean decrease of 8% in total plasma cholesterol.[5] Recognizing that elevated plasma cholesterol is a modifiable risk factor, the Adult Treatment Panel of the National Cholesterol Education Program (NCEP) recommended application of its lipid screening and management guidelines to all adults aged 20 years and older with flexibility in elderly persons.[6] The population and adult treatment panel of the National Institute of Health predicts a reduction in the incidence of coronary heart disease and mortality through dietary modification.[7] In the United States, only 43% of the population aged 20-74 years were found to have cholesterol levels within the desirable range (<5.17 mmol/l) with 57% having either borderline high (30%) or high (27%) cholesterol levels.[8] More recent data from the National Health and Nutrition Examination Surveys show a decline in the mean cholesterol level for adults 20-74 years from 5.69 mmol/l in 1960 to 1962 to 5.30 mmol/l in 1988 to 1991 with 51% of US adults having cholesterol values above the desirable level.[9] In Sweden, 24% of adult males and 12% of adult females had HC, defined as a cholesterol level of ≥6.5 mmol/l while 14% of males and 3% of females had HT, defined as a triglyceride level of ≥2. 3 mmol/l.[10] Hypercholesterolemia and HT were associated with an increased risk of acute myocardial infarction in men 40-59 years of age.

Data on cholesterol and triglyceride levels in Middle Eastern communities are scarce or nonexistent. In Saudi Arabia, Mitwali[11] conducted a survey among apparently healthy males in Riyadh City and reported a mean cholesterol level

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