

Luna AKSOY  
Serhan KÜPELİ  
Ali Bayram KASIM  
Barış KUŞKONMAZ  
Umut KARTAL  
Erpulat ÖZİŞ  
Naci YILDIZ  
Nazmi BİLİR

## Prevalence of Coronary Heart Disease Risk Factors Among Women in Köstence, Ankara

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Department of Public Health, Faculty of  
Medicine, Hacettepe University, 06100  
Ankara - Turkey

**Abstract:** Cardiovascular disease is progressively becoming a major cause of morbidity and mortality in women generally after menopause. In contrast to this general conception, the coronary morbidity and mortality in premenopausal Turkish women approaches that of Turkish men. In this study, our aim was to detect the prevalence of risk factors for coronary heart disease (CHD) among 200 women aged 30 or over who live in the Köstence area and to inform individuals presenting with CHD risk factors. Twenty-seven women (13,5%) were current smokers. The body mass index of 168 participants (84%) was greater than 24.9 kg/m<sup>2</sup> and 32.5% of women were found to

have total cholesterol levels of 200 mg/dl or above. The systolic and/or diastolic blood pressures were high in 86% of the hypertensive women and half of these women were not receiving any medication. Similarly, nearly half the diabetic women had unregulated blood glucose levels and 23.5% of them were not receiving any medication. Therefore, we would like to mention that in addition to the primary prevention and early detection of CHD, the compliance of patients with their treatment should be the focus of clinicians in order to minimize CHD morbidity and mortality.

**Key Words:** coronary heart disease, women

### Introduction

Coronary heart disease (CHD) is the leading cause of death and disability in industrial countries as well as in Turkey. CHD death rates among both men and women in the United States, western countries and Japan have decreased dramatically in recent decades (1,2). Although advances in the medical diagnosis and treatment of CHD have contributed significantly to the decline in mortality, preventive measures (both lifestyle changes and improvements in the medical management of coronary risk factors) have been estimated to account for the majority of the secular decrease in heart disease mortality (1). Unfortunately, the proportion of CHD deaths in Turkey increased from 20% in 1960 to 40-50% in 1990 (3). The adoption of western lifestyle habits seems to account for this increase, replicating patterns seen in Western European countries and the United States several decades ago.

Men experience higher coronary morbidity and mortality through middle age, whereas cardiovascular disease progressively becomes a major cause of morbidity and mortality in women only after menopause. In contrast to this general conception, the coronary

morbidity and mortality in premenopausal Turkish women approaches that of Turkish men (4,5).

Men and women share many risk factors for CHD, but high blood pressure, high blood cholesterol and smoking are more common in men (6). Interestingly, Turkish women were reported to have higher blood cholesterol levels, hypertension, diabetes and body mass index (BMI) in a 1990 cross-sectional survey (4). This seems to contribute to the unexpectedly higher prevalence of CHD in Turkish women.

In this study, our aim was to detect the prevalence of risk factors for CHD among women aged 30 or over who live in the Köstence area and to inform individuals presenting with CHD risk factors.

### Materials and Methods

This cross-sectional epidemiologic study was conducted in the area of Köstence Family Medical Center during February, 1998. Köstence is a suburban area with a population of 21,586, of whom 10,349 are women. Thirty percent of the population do not have any social security. In the medical center, there are three family

physicians, five general practitioners, two dentists, five female nurses, two male nurses, four laboratory technicians, one X-ray technician and one attendant. The infant death rate, which is an important indicator of the quality of health service is much lower in this area than in Turkey as a whole (11% vs. 44%). The crude death rate is also lower (2.38% vs. 6.4%).

Two hundred individuals, representing all women inhabitants aged 30 or over, were randomly selected. The data was obtained by face-to-face interview using a 29-item questionnaire. In addition, the body height and weight, blood cholesterol and glucose levels, and blood pressure were measured by five intern doctors, who also performed the interviews. Seventeen individuals were not included due to not being at home or refusing to participate. Consequently, 17 women were added to the study from the substitute list.

Blood pressure was measured on the right arm after the individual had rested 5 minutes in a sitting position. The presence of hypertension was noted when systolic blood pressure was equal to or higher than 160 mmHg and/or diastolic blood pressure was 95 mmHg or above.

Blood cholesterol and glucose levels were determined from capillary blood sample obtained from the fingertip by using Acutrend GC machine, Acutrend glucosticks and cholesterol sticks (Boehringer-Mannheim). Individuals with glucose levels 140 mg/dl or above were defined as being at risk of diabetes, while cholesterol levels lower than 200 mg/dl were accepted as normal.

A BMI lower than 24.9 kg/m<sup>2</sup> were defined as normal, between 25.0 and 29.9 kg/m<sup>2</sup> as obese, and 30.0 kg/m<sup>2</sup> or above as severely obese.

Data coded manually were analyzed using the EPI-INFO computer program.

## Results

Of the 200 women, 17 (8.5%) reported to having heart disease; five of these (29.4%) had a positive family history. Seven of the women (41.2%) with heart disease were found to be taking no medication, while the others were taking drugs such as nitrates, digitalis and Ca channel blockers.

Fifty-seven individuals (28.5%) stated that they had previously been diagnosed as hypertensive. The systolic, diastolic and systolic with diastolic blood pressures were

found to be high in 38.6%, 24.6% and 22.8% of these women, respectively.

Of the women who did not report high blood pressure, 4.9% were found to be hypertensive during blood pressure measurements. In this group 7.7% had systolic and 8.4% had diastolic hypertension only.

Of the hypertensive women, 31 (54.4%) were not taking any medication at that moment. Twenty-three women were receiving both drugs and diets, while three women were on a salt-free diet.

The blood cholesterol levels were equal to or in excess of 200 mg/dl in 65 of the women (32.5%). The cholesterol levels tended to increase with age (Table 2).

When smoking habits were investigated, 169 individuals (84.5%) stated that they had never smoked. Twenty-seven women (13.5%) were current smokers, while 2% were ex-smokers. The onset age of smoking was before the second decade in the majority (45.2%) of the smokers.

Only 17 women (8.5%) reported that they had diabetes mellitus. Of these diabetics, seven (41.2%) had blood glucose levels higher than 140 mg/dl. Seventeen of the non-diabetic women (9.3%) were found to be at risk of diabetes. Blood glucose levels increased with age (Table 3). Four diabetic women (23.5%) were receiving no medication.

Of all the individuals, 32 women (16%) had normal BMIs. Obesity was detected in 37.5% of women while severe obesity was observed in 46.5%. Fifty-eight women (34.5%) who had a BMI higher than 24.9 kg/m<sup>2</sup> also had higher blood cholesterol levels.

The percentages of risk factors are summarized in Table 1. Among the three major CHD risk factors, hypertension, smoking and high blood cholesterol, 71 women (35.5%) had only one risk factor, 40 (20%) had two and three (1.5%) had all three risk factors.

## Discussion

The development and progression of CHD can be delayed in women by an average of 10 years, compared with men. In addition, women generally experience their first myocardial infarction 20 years later than men (7). As the life span of women has increased, the incidence of CHD has increased. In the United States, the death of

Table 1. The Percentages of Risk Factors (Köstence, 1998).

	+	+	+	-	-	-		+	-		
Risk factors	s Hbp	d Hbp	sdHbp	s Hbp	d Hbp	sdHbp	Ch	Sm	Gl	Gl	Ob
Percentages	38.6	24.6	22.8	7.7	8.4	4.9	32.5	13.5	41.2	9.3	84

Hbp; high blood pressure, (+); previously diagnosed, (-); without disease, s; systolic, d; diastolic, sd; systolic and diastolic, Ch; hypercholesterolemia, Sm; smoking, Gl; hyperglycemia, Ob; obesity

Table 2. The Distribution of Blood Cholesterol Levels by Age (Köstence, 1998).

Age Groups (n)	Cholesterol Levels (mg/dl)	
	< 200 (n)	200 ≤ (n)
30-39 (88)	82.95% (73)	17.04% (15)
40-49 (38)	71.05% (27)	28.94% (11)
50 ≤ (74)	47.29% (35)	52.70% (39)

Table 3. The Distribution of Blood Glucose Levels by Age (Köstence, 1998).

Age Groups (n)	Glucose Levels (mg/dl)		
	≤ 109 (n)	110-139 (n)	140 ≤ (n)
30-39 (88)	70.45% (62)	26.13% (23)	3.4% (3)
40-49 (38)	68.42% (26)	26.31% (10)	5.2% (2)
50 ≤ (74)	44.59% (33)	29.72% (22)	25.67% (19)

women each year from cardiovascular disease is two to three times higher than the number of deaths caused by all cancers combined (8). Furthermore, the economic burden imposed by CHD is estimated to range between \$50 billion and \$100 billion per year in lost wages and in medical interventions in the United States (9).

Some of the CHD risk factors are modifiable. Adult cardiovascular disease is known to have its origin in childhood. There appears to be a significant relationship between fetal and early childhood nutrition and the risk of developing many of the cardiovascular diseases seen in adults (10,11). Furthermore, tobacco smoke in the environment (including parents who smoke at home, in public places and at work) is directly linked to the development of CHD (12,13). Within a matter of months after smoking cessation, CHD risk begins to decline. Within 2 to 3 years of smoking cessation, the risk decreases to approximately the level found in people who have never smoked, regardless of the amount smoked, the duration of the habit and the age at cessation (14-16). Obesity is an independent risk factor for CHD in both men and women. In addition, it worsens coronary risk factors, including hypertension, diabetes and hypercholesterolemia (15,17). In our study 27 women (13.5%) were current smokers, consistent with Açıık's

study (18). Obesity was a major problem in our study because the BMI of 168 participants (84%) was greater than 24.9 kg/m<sup>2</sup>. Onat et al. reported that 21.7% of women had a problem of obesity (19). In a study by Açıık et al., 31.6% of women had BMI higher than 30 kg/m<sup>2</sup> (18). Both of these results were lower than our results. This can be attributed to the fact that our study group consisted of only housewives.

Hypertension remains a major independent risk factor for CHD with a two to threefold risk related either to isolated systolic hypertension or systolic and diastolic hypertension. A higher rate of CHD is seen in hypertensive women with a relative risk of 3.5, compared to normotensive women (20). From many trials a mean decrease of 6 mmHg in diastolic blood pressure significantly reduced CHD by 14 to 16% (6). Half of the hypertensive women in our study were not receiving any medication. The systolic and/or diastolic blood pressures were high in 86% of women who reported that they had hypertension. The major reason for these extremely high levels may be the lack of medication.

The blood cholesterol level is a strong risk factor for CHD. Each 1% decrease in the cholesterol level is associated with an approximate 2% to 3% decrease in the risk of CHD (21). The ratio of total to HDL

cholesterol has been shown to provide a more accurate measure of coronary risk than total cholesterol alone (22). In our study, we were only able to measure total cholesterol levels and 32.5% of women were found to have total cholesterol levels 200 mg/dl or above. The cholesterol levels tend to increase age, consistent with Onat's study (23).

Diabetes mellitus is a stronger CHD risk factor in women than in men. CHD death rates are approximately three to seven times greater among diabetic women than among nondiabetic women. In contrast, male diabetics have a two to threefold greater risk of CHD death than nondiabetic men (24,25). Diabetes mellitus prevalence based on participants' answers was 8.5%. This is higher than the results of other studies (18,26). As most cases of adult onset diabetes are obesity induced, this can be attributed to the high obesity prevalence in our study. Nearly half the diabetic women had unregulated blood glucose levels and 23.5% of them were not receiving any medication.

## Conclusion

As the population ages and women outlive men, women's risk of developing CHD increases. Primary prevention and early detection of CHD should be the focus of clinicians' and public health efforts. Making significant lifestyle changes is more difficult than "taking a pill". Unfortunately, we observed that some women with hypertension or diabetes were not taking their medication. Therefore, the noncompliance of patients with their treatment seems a serious problem in our study group. In addition, the high prevalence of obesity is an other emerging result. Finally, we would like to draw the attention of physicians to the importance of focusing on not only primary prevention, but also the compliance of patients with their treatment.

### Correspondence author:

Serhan KÜPELİ

İçcebeci Oba sokak No: 13/7

Cebeci, 06590 Ankara - TURKEY

E-mail: kupeliser@hotmail.com

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