

Management of cardiovascular risk factors for primary prevention: evaluation of Turkey results of the EURIKA study

Birincil korumada kardiyovasküler risk faktörlerinin yönetimi: EURIKA çalışmasının Türkiye sonuçlarının değerlendirilmesi

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ABSTRACT

Objectives: The EURIKA study (The European Study on Cardiovascular Risk Prevention and Management in Daily Practice), which covers 12 European countries including our country, aimed to describe the management of cardiovascular risk factors in the daily practice and to detect areas of improvement. We evaluated our country-based data on the methods used by physicians to manage cardiovascular risk factors and the results of patients who participated in this study.

Study design: The EURIKA study recruited 663 patients (mean age 59.4±7.6 years; 47.2% males) and 67 physicians (55 men, 12 women; mean age 40.7±8.6 years) from Turkey. Risk factor definition and treatment goals were based on the 2007 European guidelines on cardiovascular disease prevention. Blood samples were analyzed in a central laboratory. The 10-year risk for fatal cardiovascular disease was estimated based on the SCORE system.

Results: About one-third (34.8%) of the doctors did not use any cardiovascular disease guidelines. Only 48.5% used cardiovascular risk calculation. The most common (74%) reason for not using risk calculation was stated as having limited time. The rates of reaching target total/LDL cholesterol, blood pressure, and HbA_{1c} levels were 30.4%, 32.1%, and 26% in treated dyslipidemics, hypertensives, and diabetics, respectively. Hypertension, diabetes, dyslipidemia, and smoking accounted for 59.4% of attributable cardiovascular risk. Lack of control of these risk factors accounted for 31.8% of cardiovascular risk.

Conclusion: Only half of our doctors use cardiovascular risk calculation, and therapeutic guidelines are not adequately used. Moreover, the control rates of risk factors in primary prevention are low.

ÖZET

Amaç: EURIKA çalışması (The European Study on Cardiovascular Risk Prevention and Management in Daily Practice), ülkemizin de içinde olduğu 12 Avrupa ülkesinde, günlük pratikte kardiyovasküler risk faktörleri yönetiminin nasıl yapıldığını ve potansiyel iyileştirme alanlarını saptamaya yönelik yapılmış bir epidemiyolojik çalışmadır. Bu çalışmaya ülkemizden katılan doktorların kardiyovasküler riski yönetmede kullandıkları yöntemler ve hastaların bulguları değerlendirildi.

Çalışma planı: EURIKA çalışmasına ülkemizden toplam 663 hasta (ort. yaş 59.4±7.6; %47.2 erkek) ve 67 doktor (55 erkek, 12 kadın; ort. yaş: 40.7±8.6) katıldı. Risk faktörleri tanımı ve tedavi hedefleri 2007 Avrupa kardiyovasküler hastalıkları önleme kılavuzuna göre yapıldı. Kan örnekleri merkezi bir laboratuvarda analiz edildi. On yıllık ölümcül kardiyovasküler hastalık riski SCORE yöntemine göre hesaplandı.

Bulgular: Doktorların %34.8'i kardiyovasküler hastalık kılavuzu kullanmıyordu. Sadece %48.5'i kardiyovasküler risk hesaplaması yapmaktaydı. Kardiyovasküler risk hesaplaması kullanmamanın en sık nedeni (%74) zaman kısıtlılığı olarak gösterildi. Tedavi görmekte olan hastalar açısından, dislipidemilerde total/LDL kolesterol hedefine %30.4, hipertansiyonlularda kan basıncı hedefine %32.1, diyabetlilerde HbA_{1c} hedefine ulaşma oranı sırasıyla %30.4, %32.1 ve %26 bulundu. Hipertansiyon, diyabet, dislipidemi ve sigara kardiyovasküler riskin %59.4'ünden sorumluydu. Bu risk faktörlerinin kontrol altında olmamasına atfedilebilen kardiyovasküler risk %31.8 idi.

Sonuç: Doktorlarımızın sadece yarısı kardiyovasküler risk hesaplaması yapmaktadır. Tedavi kılavuzları yeterince kullanılmamaktadır. Ayrıca, kardiyovasküler risk faktörlerinin birincil korumada kontrol altına alınma oranları düşüktür.

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Cardiovascular diseases are the most important causes of mortality and disability in developed countries.^[1-3] The high incidence and high cost of these diseases have rendered the control of cardiovascular risk factors important.^[4-6] However, it is known that cardiovascular risk factors cannot be adequately controlled. The prevalence and control rates of cardiovascular risk factors in European countries vary on country basis.^[7,8] Therefore, mortality rates attributed to classical cardiovascular risk factors are specific to communities and expected to differ between countries. There may be diverse reasons to these differences originating from doctors, patients, or healthcare policies.

The EURIKA study (The European Study on Cardiovascular Risk Prevention and Management in Daily Practice; ClinicalTrials.gov identifier, NCT00882336) is a multinational and multicentered epidemiologic study to determine how the cardiovascular risk factors are managed in the daily practice and to describe the potential therapeutic fields in 12 European countries, including Turkey.^[9-12] The secondary objective of the EURIKA study is to estimate the global cardiovascular risk scores in the clinical practice and to describe the barriers against their use. In this article, data of our country obtained from the EURIKA study were presented.

MATERIALS AND METHODS

Selection of doctors and patients

The EURIKA study was conducted simultaneously on a cross-sectional basis in 12 European countries from May 2009 to January 2010.^[9] The physicians who would participate in the study were selected in a randomized manner according to the criteria used to define the representation of the target population of the country (taking into consideration the age, gender, and speciality), from the OneKey Database of the Cegedim Strategic Data. Subject sample was chosen to be representative of the nation.

Through a detailed, 6-page questionnaire administered to the doctors, the perception of the doctor about cardiovascular risk factors, compliance to the guideline principles, and cost reduction were determined. This form also included personal information of the doctors, their workplace, their knowledge about the prevention and management of cardiovascular risks, methods they used to evaluate the risk, and the guidelines they used for risk management. Furthermore, the barriers they experienced during the use of risk evaluation were questioned.

Patients who were enrolled in the study were randomly selected from those presenting to a primary care institution or hospital outpatient clinic, ≥ 50 years of age, had no previous experience of cardiovascular events, and had at least one cardiovascular risk factor. Dyslipidemia, hypertension, smoking, diabetes mellitus, and obesity were taken as cardiovascular risk factors. Dyslipidemia was defined as LDL cholesterol of ≥ 160 mg/dl and/or HDL cholesterol of < 40 mg/dl in males and < 50 mg/dl in females and/or triglyceride of ≥ 150 mg/dl and/or lipid-lowering drug use. Hypertension was defined as systolic blood pressure ≥ 140 mmHg or diastolic blood pressure ≥ 90 mmHg and/or use of antihypertensive drugs. Those who were currently smoking and those, even quitted, who had smoked ≥ 100 cigarettes during a period in their lifetime were considered to be smokers. Those with fasting blood glucose ≥ 126 mg/dl and/or those who were using antidiabetic drugs were considered to be diabetic. Body mass index of ≥ 30 kg/m² and waist circumference of ≥ 102 cm in males and ≥ 88 cm in females were considered to indicate obesity. All participants gave written consent. Approval for the study was obtained from the central ethics committee of the Ministry of Health.

Abbreviations:

CVD	Cardiovascular diseases
EURIKA	The European Study on Cardiovascular Risk Prevention and Management in Daily Practice

Twelve-hour fasting blood samples were collected. The samples were sent to a central laboratory in Belgium for analysis (The Bio Analytical Research Corporation, www.barclab.com). High-density lipoprotein cholesterol was measured by a modified enzymatic method (Roche P-Modular analyzer), total cholesterol was measured by the CHOD-PAP method (Roche P-Modular), triglycerides were measured by the GPO-PAP method (Roche P-Modular), and low-density lipoprotein cholesterol was calculated using the Friedewald formula. Glycosylated hemoglobin (HbA_{1c}) was measured by ion-exchange high-performance liquid chromatography on the Menarini 8160.

The 10-year risk for fatal CVD was calculated for each patient using the SCORE equation, based on age, sex, current smoking status, total cholesterol, and systolic blood pressure measured at the study visit. The equation developed for high-risk regions was used for patients in Turkey.^[9] The calculation method of the risks and excess risks attributable to each CVD risk factor was given in a previous publication of the EURIKA study.^[11] Briefly, the risks attributable to each CVD risk factor were calculated assuming that

Table 1. Characteristics of the patients and distribution of risk factors

	Total (n=663)			Male (n=313)			Female (n=350)		
	n	%	Mean±SD	n	%	Mean±SD	n	%	Mean±SD
Age (years)			59.4±7.6						
<65 years	511	77.1							
≥65 years	152	22.9							
Body mass index (kg/m ²)			30.2±5.2			29.1±6.9			32.0±6.4
Waist circumference (cm)			102.3±12.7			103±12			101±15
Hip circumference (cm)			109.8±12.9			106±10			113±14
Systolic blood pressure (mmHg)			134±19			132±18			137±20
Diastolic blood pressure (mmHg)			82±12			81±12			83±12
Smoking	311	46.9		230	73.5		81	23.1	
Current smoker	157	23.7		106	33.9		51	14.6	
Quitted	154	23.2		124	39.6		30	8.6	
Hypertension	441	66.5		174	55.6		267	76.3	
Dyslipidemia	218	32.9		94	30.0		124	35.4	
Diabetes mellitus	208	31.4		99	31.6		109	31.1	
Obesity	240	36.2		91	29.1		149	42.6	
Family history of coronary artery disease	171	25.8		65	20.8		106	30.3	
Total cholesterol (mmol/l)			5.3±1.1			5.2±1.1			5.4±1.0
LDL cholesterol (mmol/l)			3.1±0.9			3.0±0.9			3.2±0.9
HDL cholesterol (mmol/l)			1.3±0.3			1.2±0.3			1.4±0.3
Triglyceride (mmol/l)			2.1±1.4			2.3±1.7			1.9±0.9
HbA _{1c} (%)			6.5±1.6			6.4±1.5			6.5±1.7

participants with each risk factor did not have the particular risk factor.

Statistical analysis

Continuous variables were expressed as mean values±SD, and categorical variables as percentages. All variables were modeled as categorical with dummy terms. Statistical significance was set at a two-tailed *P* value <0.05. Analyses were performed using the SAS system (version 9.1, SAS Institute, Inc., Cary, NC, USA).

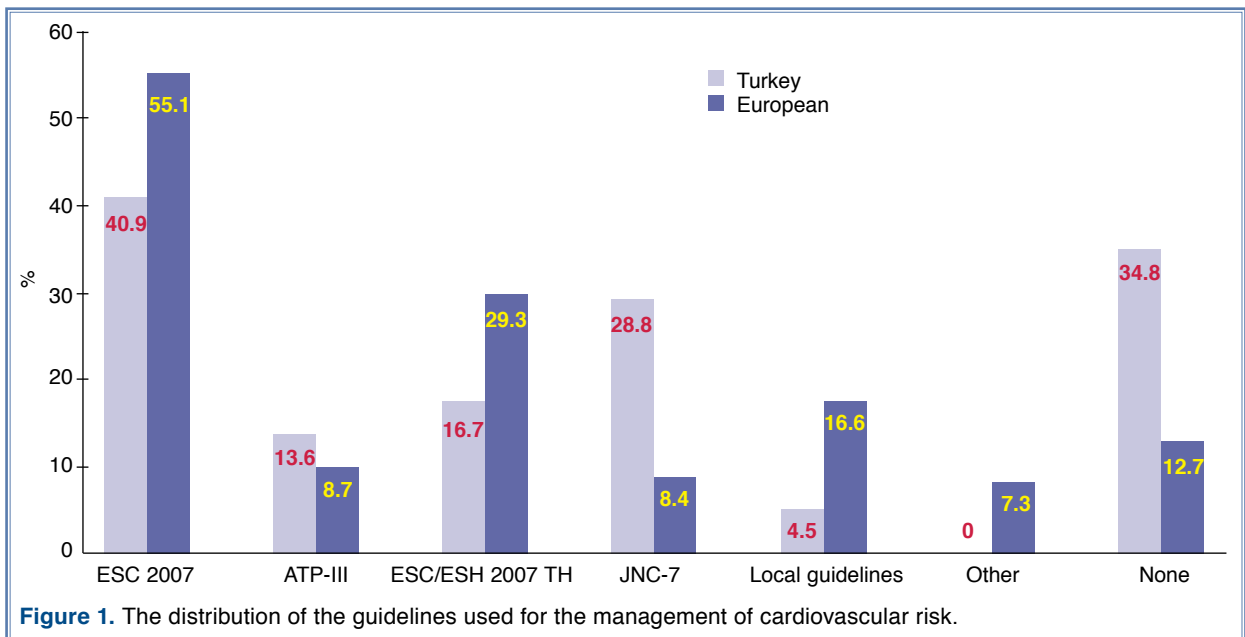
RESULTS

The study enrolled 67 doctors (55 men, 12 women) with a mean age of 40.7±8.6 years, with ages below 35 years in 22% and 50 years or above in 16%. Of 67 doctors, 45 (67.2%) were family doctors/general practitioners, 10 (14.9%) were internists, six (9%) were cardiologists, and six were from other specialties. Thirty-six doctors (53.7%) were working in a primary healthcare institution and 12 (17.9%) were working in rural places. Six

doctors (9%) were seeing <50 patients/week, 12 doctors (17.9%) 50-99 patients/week, 13 doctors (19.4%) 100-199 patients/week, and 36 doctors (53.7%) ≥200 patients/week.

The distribution of the guidelines used to manage the cardiovascular risk was given in Fig. 1, together with comparisons to the mean values calculated for Europe. The doctors of our country preferred to use 2007 guidelines on cardiovascular disease prevention in clinical practice of the European Society of Cardiology, JNC-7, and 2007 hypertension guideline of the European Society of Cardiology/European Association of Hypertension. In addition, approximately one-third of our doctors (34.8%) were not using any guideline. The reasons for not using any guidelines were stated as follows: lack of knowledge (34.8%), having limited time (30.4%), complexity of the guidelines (17.4%), high number of the guidelines and difficulty in selecting the most appropriate one (2.7%), and other reasons (4.3%).

Of the doctors, 48.5% were using cardiovascular risk calculation in their daily practice and, of them,

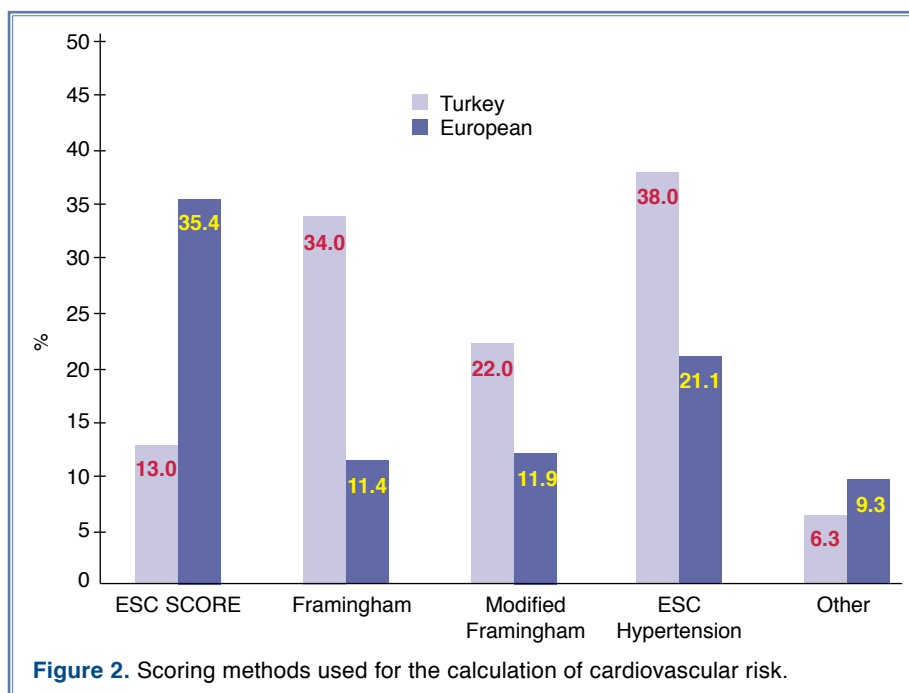


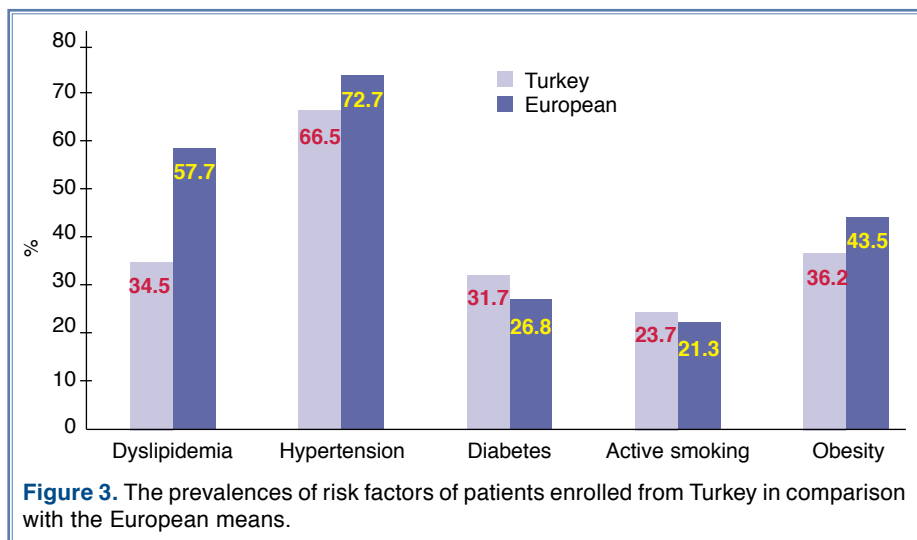
72% calculated cardiovascular risk using cards, 19% using computer software, and 16% using other ways. The distribution of scoring methods used to calculate cardiovascular risk is given in Fig. 2, accompanied by comparative scores of Europe.

Doctors who did not use cardiovascular risk calculation (51.5%) in their daily practice reported the following reasons: having limited time (74%), not knowing how to use (21%), not considering it to be beneficial (12%), not knowing how to use the results

obtained from risk calculation (9%), and other reasons (6%). In addition, 33% of the doctors believed that cardiovascular risk calculation and scoring had some limitations, such as overestimation of the risk (77%), failure of covering or consideration of some important risk factors (59%) or allowing the calculation of risk in elderly (55%). Moreover, 82% thought that the calculated risk duration (10 years) was very long.

Of the doctors, 35% thought that they could not allocate enough time to their patients, and 76% stated





that there was no adequately structured system in their clinic to ensure primary prevention in CVD. The absence of such a system was attributed to the lack of staff (70%), inadequate budgeting (24%), lack of interest of the managers (14%), inadequate encouragement of the doctors (14%), and other reasons (10%).

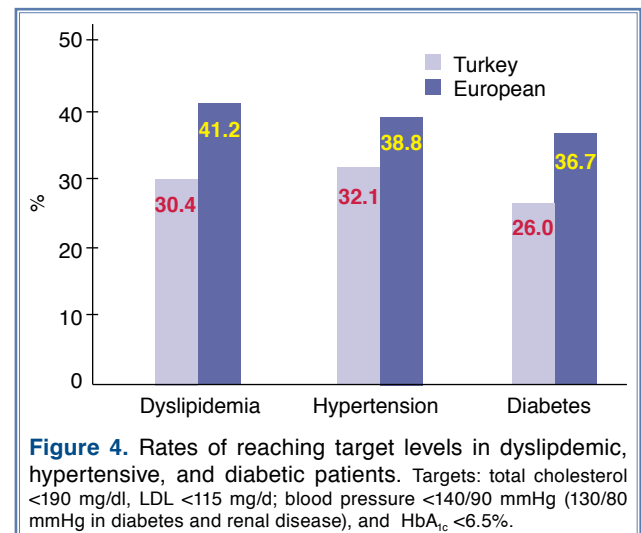
A total 663 patients (mean age 59.4 ± 7.6 years, 52.8% females) were included in the study. Their main characteristics and distribution of risk factors are given in Table 1. The most frequent cardiovascular risk factors were hypertension, smoking, obesity, dyslipidemia, diabetes mellitus, and family history of coronary artery disease. The prevalences of risk factors are given in Fig. 3, in comparison with those of the European study. While smoking was more prevalent in males, obesity was more common in females. Based on physicians' interpretations, 514 patients (77.5%) had a high cardiovascular risk, seen in 73.8% of males, and in 80.9% of females. However, 10-year CVD SCORE risk was $\geq 5\%$ in only 33.6% of the patients.

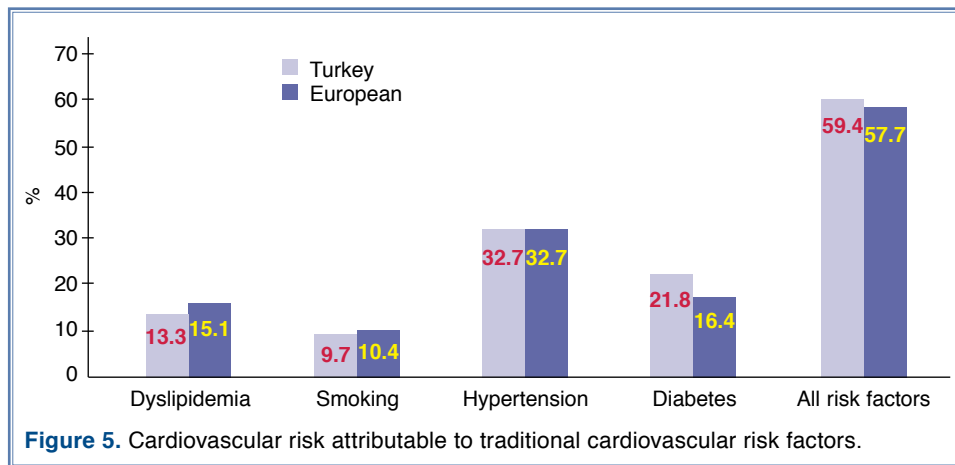
The rates of reaching target values were very low for patients with dyslipidemia, hypertension, and diabetes mellitus (Fig. 4). Fig. 5 shows cardiovascular risk distribution attributable to traditional cardiovascular risk factors. The highest risk was associated with hypertension, followed by diabetes, dyslipidemia, and smoking. These risk factors in concert accounted for 59.4% of the attributable CVD risk. Compared to the EURIKA study, the risk associated with diabetes was particularly high in Turkish patients. Cardiovascular risks attributable to lack of control of hypertension, dyslipidemia, smoking, and diabetes are given in Fig. 6. Lack of control of these risk factors accounted for 31.8% of the attributable CVD risk.

DISCUSSION

The Turkish data of the EURIKA study showed that only half of the doctors concerned with cardiovascular risk management used cardiovascular risk calculation, and control rates of cardiovascular risk factors were low.

Among our doctors, the percentage of not using any guideline was significantly higher (34.8%) than that of Europe (12.7%). The reasons for not using guidelines differ by country. The most commonly cited reason for not using guidelines in Europe was the high number of guidelines raising difficulties in selection, with 47.1%. However, in our country, the most common reason for not using the guidelines (34.8%) was the lack of information. Given the mean percentage of 27.5% for Europe, training programs across Europe are needed



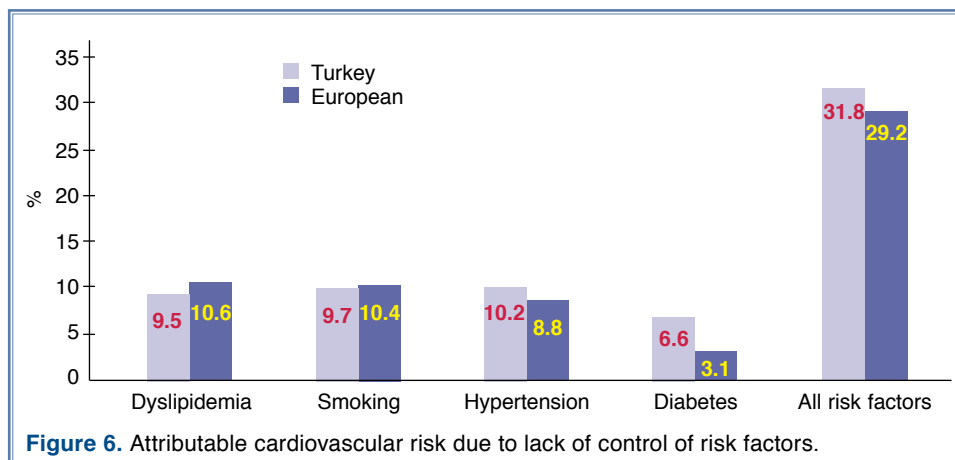


to enhance knowledge about the guidelines. Limited time is the second most common reason for not using guidelines in both our country and Europe, which is a general problem mentioned in many studies.^[13,14] Furthermore, 12% of our doctors did not use a guideline because they did not find it useful, compared to 23.5% of doctors in Europe, suggesting that improvements should be considered for the guidelines. These observations show that the doctors would prefer the guidelines to be smaller in number, shorter, and more comprehensible.

The mean percentage of cardiovascular risk calculation in the EURIKA study was 68.5% for Europe, with the lowest rate in our country, together with France (49.1%).^[10] The main reason for not using cardiovascular risk calculation in daily practice was reported as having limited time by 74% of our doctors, compared to the European rate of 59.8%, which was also stated as the most common reason in almost all European countries, thereby making it a global problem. In addition, approximately one-third of our

doctors (30%) reported that they did not know how to calculate the risk or how to use the results of risk calculation. This rate was 19.7% among European doctors. Thus, an important percentage of doctors do not know how to calculate the cardiovascular risk or how to use the results obtained from the calculation, emphasizing the need for training programs about risk calculation.

The frequency of a SCORE risk of $\geq 5\%$ in Turkish patients was low (33.6%) compared to that of the European, and represented the lowest rate among the countries participating in the EURIKA study. Therefore, participants from our country were relatively at low risk. Risk distribution of Turkish patients exhibited some differences, as well. The prevalences of dyslipidemia and obesity were low compared to the European figures, and were the lowest among the countries participating in the study. Active smoking rate was also remarkable, which was not higher than the European mean. This may stem from the recent legal regulations and nationwide campaigns against smoking.



Control rate of total cholesterol and LDL cholesterol in dyslipidemic patients receiving treatment was 30.4% in Turkey. This rate was relatively low compared to the European mean of 41.2%, though control rates were lower than 40% in half of the 12 European countries participating in the study. These figures show that the problem of inadequate treatment in dyslipidemic patients persists throughout Europe.

A comparison of three EUROASPIRE studies suggests that the control rates of cardiovascular risk factors are still too low even in patients with known coronary artery disease.^[15,16] The results of the last EUROASPIRE (III) study showed that the mean total cholesterol control rate across Europe was as low as 48.9% in those with coronary artery disease.^[15] An analysis of the Turkish arm of the EUROASPIRE III study demonstrated a slightly higher total cholesterol control rate (51.7%) than the European mean.^[17]

The most frequently seen risk factor in patients enrolled from Turkey was hypertension, which was found to be 66.5%. Hypertension was also the most frequent risk factor in other European countries, with a mean of 72.7%. Blood pressure control rate in hypertensive patients on treatment was 32.1% in our country, a finding consistent with lower rates than 40% in many European countries. In a large study including 15,187 patients from primary care institutions in Turkey, blood pressure control rate in treated hypertensive patients was found to be 24.2%.^[18] Considering an elapsed time of five years from this finding, it may be enunciated that some improvement has been achieved in blood pressure control rate. In another analysis of the same study, it was found that, contrary to guideline recommendations, most of the patients remained on single-drug therapy despite inadequate blood pressure control.^[19] According to Turkey results of the EUROASPIRE III, blood pressure control rate was 44.8% in patients with coroner artery disease, which is similar to our finding.^[17] In the EUROASPIRE III, European mean blood pressure control rate was 43.9% in patients using antihypertensive drugs.^[15]

The frequency of diabetes mellitus in patients participating from Turkey was 31.7%, which was slightly higher than the European mean of 26.8%. The control rate of HbA_{1c} in patients with diabetes mellitus was lower compared to the European mean (26% vs. 36.7%). The Turkish arm of the EUROASPIRE III reported the rate of reaching target HbA_{1c} (<6.5%) as 23.8%, similar to our finding.^[17]

Hypertension is the most important risk factor responsible for the attributable risk among cardiovascu-

lar risk factors. The roles of dyslipidemia, smoking, and diabetes mellitus seem to be similar in attributable risk factors. In general, the rates in our country are similar to the European means except for diabetes. The difference in the attributable risk for diabetes was particularly high in Turkey. Lack of control of CVD risk factors was responsible for almost one-third of CVD mortality risk. Thus, an approach targeting the control of all these risk factors should be considered. A recent review showed that attempts to improve awareness about cardiovascular risk factors might be beneficial for prevention of CVD.^[20] For this reason, it is important to place weight on raising public awareness in addition to educating doctors and improving their awareness. Recently, the Turkish Society of Cardiology has predominantly launched several endeavors to raise awareness in society.

In conclusion, the results obtained from the EURIKA study showed that only half of our doctors calculate cardiovascular risk during their daily practice. In addition, the use of therapeutic guidelines about cardiovascular risk management is far from adequate. Being less than 50%, control rates of classic cardiovascular risk factors with regard to primary prevention are very low in our country. Further studies are needed for better control of cardiovascular risk factors especially in high-risk patients.

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Key words: Cardiovascular diseases/prevention & control; physician's practice patterns; questionnaires; risk assessment; Turkey/epidemiology.

Anahtar sözcükler: Kardiyovasküler hastalık/önleme ve kontrol; hekim uygulamaları; anket; risk değerlendirmesi; Türkiye/epidemioloji.