

Lessons from EUROASPIRE I, II, and III surveys

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Abstract

The European Society of Cardiology (ESC) has carried out three surveys with the acronym EUROASPIRE (European Action on Secondary and Primary Prevention through Intervention to Reduce Events) on lifestyle and risk-factor management and use of drug therapies in patients with coronary heart disease (CHD), and in asymptomatic individuals at high risk of developing cardiovascular disease (CVD) in Europe. EUROASPIRE I was conducted during 1995–1996 in nine countries, EUROASPIRE II during 1999–2000 in 15 countries, and EUROASPIRE III during 2006–2007 in 22 countries. The EUROASPIRE III survey was extended beyond coronary patients to include apparently healthy individuals being treated as at high cardiovascular risk due to markedly raised blood pressure, total cholesterol, or diabetes in general practice in 12 European countries.

The results of the European surveys show that the lifestyle of coronary and high-risk patients is a major cause of concern, with persistent smoking and high prevalence of both obesity and central obesity. Blood pressure, lipids and glucose control are inadequate, with most patients, not achieving the targets defined in the prevention guidelines. There is considerable potential throughout Europe to raise the standard of preventive cardiology through more lifestyle intervention, control of other risk factors, and optimal use of prophylactic drug therapies. Cardiovascular disease prevention needs a comprehensive, multidisciplinary approach that addresses lifestyle and risk-factor management by cardiologists, general practitioners, nurses and other health professionals, and a healthcare system that invests in prevention.

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Introduction

Cardiovascular disease (CVD) is the major cause of death, hospital admissions and disability in middle-aged and older patients in Europe [1,2]. The main objectives of CVD prevention are to reduce the risk of first or recurrent atherosclerotic events and to improve both quality of life and life expectancy for people at increased risk of developing CVD and those with established cardiovascular disease. The Joint European Societies (JES) guidelines on prevention of CVD in clinical practice published in 1994, 1998,

2003 and 2007 made recommendations for a healthier lifestyle and set goals for blood pressure, lipid and glucose management and the use of cardioprotective medication [3–6].

However, risk-factor management in patients with coronary heart disease (CHD) and those at high risk of developing CVD in Europe is far from optimal. Guidelines implementation in daily clinical practice has been evaluated with three cross-sectional surveys called EUROASPIRE (European Action on Secondary and Primary Prevention through Intervention to Reduce Events) starting in mid-1990s. The European

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Society of Cardiology Euro Heart Survey program carried them out in 1995–1996, 1999–2000 and 2006–2007 [7–12].

EUROASPIRE surveys

The first EUROASPIRE survey was carried out in coronary patients in nine European countries: Czech Republic, Finland, France, Germany, Hungary, Italy, the Netherlands, Slovenia, and Spain [7]. Following the publication of the 1998 JES recommendations on coronary prevention, the second EUROASPIRE survey was conducted in 15 European countries: Belgium, Czech Republic, Finland, France, Germany, Greece, Hungary, Ireland, Italy, the Netherlands, Poland, Slovenia, Sweden, Spain, and the United Kingdom [8,9]. The results of the EUROASPIRE I and II surveys demonstrated a high prevalence of modifiable risk factors in patients with CHD and wide variations in medical practice between countries. The third EUROASPIRE survey was extended beyond coronary patients to include apparently healthy individuals at high risk of developing CVD. In this way the EUROASPIRE III survey covered the complete spectrum of patient priorities as defined in the guidelines [10–12].

The EUROASPIRE III survey was carried out in selected geographical areas in 22 countries in Europe (Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, the Netherlands, Poland, Romania, Russian Federation, Slovenia, Spain, Turkey, and the UK) [10].

The overall objectives of EUROASPIRE III survey were:

1. To determine whether the Joint European Guidelines on cardiovascular disease prevention are being followed in hospitalized coronary patients (acute myocardial infarction and ischemia and following revascularisation by angioplasty or coronary artery surgery) and in high CVD-risk individuals being treated in primary care.
2. To determine whether the practice of preventive cardiology in patients with established coronary disease in EUROASPIRE III had improved by comparison with those centers that took part in EUROASPIRE I and II.

The main outcome measures were the proportions of coronary and high cardiovascular risk patients achieving the lifestyle, risk factor and therapeutic targets for cardiovascular disease prevention.

In the hospital arm, consecutive patients—men and women <80 years of age, with a clinical diagnosis of CHD (coronary artery bypass graft operation [CABG], percutaneous coronary intervention [PCI], myocardial

infarction [MI] or acute myocardial ischemia without MI)—were identified retrospectively from medical notes and interviewed and examined at least six months after their acute coronary event or procedure.

A total of 13,935 medical records were reviewed and 8,966 patients (25.3% women) interviewed on average 1.24 years following their index event (participation rate 73.0%). At interview, 17.2% of patients smoked cigarettes, 81.8% had body mass index (BMI) >25 kg/m², 35.3% were obese (BMI >30 kg/m²), 52.7% had central obesity (waist circumference >102 cm in men or >88 cm in women), and 56.0% had raised blood pressure (BP >140/90 mmHg; >130/80 mmHg for patients with diabetes). The prevalence of elevated total cholesterol (>4.5 mmol/l) and LDL-cholesterol (>2.5 mmol/l) was 51.1% and 54.5% respectively; 36.7% had decreased serum HDL cholesterol (<1 mmol/l for men and <1.2 mmol/l for women) and 34.7% had triglycerides >1.7 mmol/l. In addition, 34.8% had diabetes (self reported or fasting plasma glucose >7 mmol/L). The therapeutic control of blood pressure (BP) was poor, with only 37.3% of patients on blood pressure lowering medication being controlled (BP <140/90 mmHg; <130/80 mmHg for patients with diabetes). In those on lipid-lowering medication, just over a half (55.0%) had reached the total cholesterol goal of <4.5 mmol/L. Only 10.4% of patients with self-reported diabetes had fasting plasma glucose <6.1 mmol/l and 34.7% had HbA1c <6.5%. The use of cardioprotective medication was as follows: aspirin or other anti-platelets drugs, 90.5%; beta-blockers, 79.8%; angiotensin-converting enzyme (ACE) inhibitors, 59.9%; angiotensin-receptor blockers (ARBs), 12.0%; statins, 78.1%; and anticoagulants, 5.6%.

The comparison between those eight countries that participated in the EUROASPIRE I, II and III surveys demonstrates a compelling need for more effective lifestyle management of coronary patients [11]. Adverse trends in smoking prevalence in younger women and the alarming increase in obesity, central obesity and diabetes are an increasing cause for concern. The overall prevalence of smoking was virtually unchanged (20.3%, 21.2%, and 18.2% respectively) but had increased in younger (<50 years) women from 30.0% to 50.0% over this period. The prevalence of obesity increased substantially: 25.0%, 32.6%, and 38.0% respectively, with a corresponding increase in central obesity. Despite a substantial increase in the use of anti-hypertensive medications, blood pressure management remained unchanged, and although lipid management continues to improve, because of statin therapy, almost half of all patients were still above the recommended lipid targets. The proportion of patients with a raised blood pressure (>140/90 mmHg for non-diabetics and >130/80 in patients with diabetes) was virtually unchanged—58.1%, 58.3% and 60.9%—with nearly three-fifths of all patients on blood

pressure lowering medication not achieving the blood pressure goal in the third survey. The prevalence of elevated total cholesterol (>4.5 mmol/l) had decreased substantially: 94.5%, 76.7%, and 46.2%. However, nearly two-fifths of patients on lipid-lowering medication in the third survey had not reached the total cholesterol goal. The prevalence of self-reported diabetes mellitus increased across the surveys—17.4%, 20.1%, and 28.0% respectively. Cardioprotective drug use had also increased across the surveys: aspirin or platelet-active drugs 80.8%, 83.6%, and 93.2%; beta-blockers 56.0%, 69.0%, and 85.5%; ACE inhibitors/ARBs 31.0%, 49.2%, and 74.2%; and lipid-lowering drugs 32.2%, 62.7%, and 88.8%.

The general practice arm was carried out in 12 European countries: Belgium, Bulgaria, Croatia, Finland, Germany, Italy, Latvia, Poland, Romania, Slovenia, Spain, and the United Kingdom [12]. Consecutive patients, men and women <80 years of age, without a history of coronary or other atherosclerotic disease, either started on antihypertensive and/or lipid lowering and/or anti-diabetes treatments, were identified retrospectively and interviewed and examined at least six months after the start of medication.

A total of 5,687 medical notes were reviewed and 4,366 patients (57.7% females) considered to be at high cardiovascular risk were interviewed after the start of drug treatment (participation rate 76.7%). Overall, 16.9% smoked cigarettes, 43.5% were obese (BMI >30 kg/m²) and 61.6% centrally obese (waist circumference >102 cm in men or >88 cm in women), 70.8% had blood pressure $>140/90$ mm Hg ($>130/80$ in people with diabetes mellitus), 66.4% had total cholesterol >5 mmol/l (>4.5 mmol/l in people in diabetes), and 38.6% had diabetes (self-reported or fasting plasma glucose >7 mmol/l). The risk factor control was very poor, with only 26.3% of patients using anti-hypertensive medication achieving the blood pressure goal, and 30.6% of patients on lipid-lowering medication achieving the total cholesterol goal. Only 8.6% of patients with self-reported diabetes had fasting plasma glucose <6.1 mmol/l and 39.9% had HbA1c <6.1 %. The use of blood pressure lowering medication in people with hypertension was: beta-blockers, 34.1%; ACE inhibitors/ARBs, 60.8%; calcium channel blockers, 26.3%; diuretics, 36.9%. Statins were prescribed in 47.0% of people with hypercholesterolemia. Of all patients, 22.0% were on aspirin or other anti-platelet medication.

The European challenge for preventive cardiology

The EUROASPIRE surveys give a unique European picture of preventive cardiology as practiced by car-

diologists, other specialists and primary care physicians looking after patients with coronary disease and their families, and also people at high risk of developing CVD. They provide an objective assessment of clinical outcomes at least a year after their index event, either for hospitalization with coronary disease or having been started on medical therapy in primary care. The results show that the lifestyle of coronary and high-risk patients is a major cause for concern, with persistent smoking, especially among younger patients and high prevalence of both obesity and central obesity. Blood pressure, lipid and glucose control are inadequate, with most patients not achieving the targets defined in the prevention guidelines. There is considerable potential throughout Europe to raise the standard of preventive cardiology care through more effective lifestyle intervention, rigorous control of other risk factors, and optimal use of prophylactic drug therapies. It is possible to further reduce the gap between guideline standards and clinical practice by providing a comprehensive program of preventive care addressing all aspects of lifestyle and risk factor management by cardiologists, general practitioners, nurses and other allied health professionals, and a healthcare system that invests in prevention.

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