

Treatment of Patients With Coronary Heart Disease Fails to Meet Standards of European Guidelines: Results of EUROASPIRE Surveys

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Cardiovascular disease (CVD), of which coronary heart disease (CHD) is the most common, is the major cause of death in adults in most European countries.^{1,2} By the year 2000, CVD caused more than 4.35 million deaths annually in Europe (1.9 million in the European Union) and accounted for 43% of all deaths in men and 55% in women of all ages.³ Although CHD mortality is declining in the majority of European countries, the actual number of patients with CHD has been increasing. This is caused by several factors: aging of the populations, later onset of clinical manifestation of the disease, and improved prognosis of individuals afflicted. CVD is an important cause of disability and contributes substantially to the escalating costs of healthcare.⁴

The overall objective of cardiovascular prevention in patients with CHD is to reduce their risk of further atherosclerotic events, to prolong survival and to improve quality of life. The scientific evidence that lifestyle interventions, control of other risk factors, and appropriate use of cardioprotective medication can reduce the risk of recurrence is compelling. The guidelines of the Joint European Societies -European Society of Cardiology, European Society of Hypertension, and European Atherosclerosis Society- on prevention of CVD in clinical practice put top priority on patients with coronary or other atherosclerotic cardiovascular disease, with defined lifestyle, risk factor, and therapeutic targets.^{1,5-7} The objective of the guidelines is to raise the standard of preventive cardiology by encouraging the development and revision of national guidance on CVD prevention through collaboration between multidisciplinary

alliances of professional societies at the national level, and their implementation and audit by cardiologists and other physicians in hospitals and the community.

However, risk factor management in patients with CHD in Europe is far from optimal. The results of EUROASPIRE (European Action on Secondary Prevention through Intervention to Reduce Events) surveys, carried out by the European Society of Cardiology in 1995-1996, 1999-2000, and 2006-2007, showed that integration of CVD prevention into daily clinical practice is inadequate.⁸⁻¹² The overall objectives of these 3 surveys were: *a*) to determine in coronary patients whether the Joint European Guidelines on CVD prevention have been followed, and *b*) to describe the time trends over 12 years in the management of lifestyle, other risk factors such as blood pressure, lipids and diabetes, and use of cardioprotective drug therapies in Europe.

EUROASPIRE surveys were designed as cross-sectional studies and were conducted in selected geographical areas and hospitals in each participating country. Consecutive patients, men and women <80 years of age, with a clinical diagnosis of CHD (coronary artery bypass graft operation, percutaneous coronary intervention, myocardial infarction, or acute myocardial ischaemia without myocardial infarction), were identified retrospectively. Data collection was based on a review of patients' medical notes and a prospective interview and examination at least 6 months after their acute coronary event or procedure, using standardized methods and instruments.

The first EUROASPIRE survey was conducted in 1995-1996 following publication in 1994 of the first Joint European Guidelines on prevention of CHD in clinical practice.⁵ EUROASPIRE I was done in selected geographical areas and hospitals in 9 European countries: Czech Republic, Finland, France, Germany, Hungary, Italy, The Netherlands, Slovenia, and Spain.⁸ The results showed that lifestyle, risk factor, and therapeutic management of patients with CHD is completely

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inadequate. The second Joint European Societies recommendations on CHD prevention published in 1998 reinforced the priorities and goals given in the 1994 recommendations.⁶ Following their publication, the second EUROASPIRE survey was conducted in 1999-2000 in 15 European countries, including all 9 countries which participated in the first survey.^{9,10} The additional countries were Belgium, Greece, Ireland, Poland, Sweden, and the United Kingdom. The comparison of EUROASPIRE II with EUROASPIRE I results in those 9 countries participating in both surveys described a "collective failure of medical practice" as they revealed adverse lifestyle trends with no improvement in blood pressure management and the majority of patients not achieving the total cholesterol target.

In 2003, the Joint European Guidelines of CVD prevention were revised by the Third Joint Task Force, in which the original collaborating scientific societies were joined by the European Association for the Study of Diabetes and the International Diabetes Federation Europe.⁷ After their publication, the third EUROASPIRE survey was conducted in 22 countries, including 14 of those countries that participated in EUROASPIRE II. The new countries were Bulgaria, Croatia, Cyprus, Latvia, Lithuania, Romania, Russia, and Turkey.^{11,12}

In EUROASPIRE III, 13,935 medical records were reviewed and 8966 patients (25.3% women) interviewed on average 1.24 years following their index event (participation rate, 73%). At interview, 17.2% of patients smoked cigarettes; only 1 in 2 of those who smoked before the index event had stopped. The prevalence rates of overweight and obesity were alarming in all countries: 81.8% were overweight (body mass index [BMI] ≥ 25 kg/m²), 35.3% were obese (BMI ≥ 30 kg/m²), and 52.7% had central obesity (waist circumference ≥ 102 cm in men or ≥ 88 cm in women). The blood pressure control was not optimal, with the majority of patients (56.0%) having raised blood pressure (BP $\geq 140/90$ mm Hg; $\geq 130/80$ mm Hg for patients with diabetes). The prevalence of elevated total cholesterol (≥ 4.5 mmol/L) and low density lipoprotein cholesterol (LDL-C) (≥ 2.5 mmol/L) was 51.1% and 54.5% respectively; 36.7% had decreased high density lipoprotein cholesterol (HDL-C) (serum HDL-C < 1 mmol/L for men and < 1.2 mmol/L for women) and 34.7% had raised triglycerides (fasting serum triglycerides ≥ 1.7 mmol/L). Just over a third of patients (34.8%) had diabetes (self reported or fasting plasma glucose ≥ 7 mmol/L). The therapeutic control of blood pressure was poor, with only 37.3% of patients using blood pressure lowering medication being controlled (BP $< 140/90$ mm Hg; $< 130/80$ mm Hg for patients with diabetes). In those on lipid-lowering medication, just over

half (55%) had reached the total cholesterol goal of < 4.5 mmol/L. This is despite the increased use of lipid-lowering medication with nearly four-fifths of patients being on lipid-lowering drugs, principally statins at interview. The therapeutic control of diabetes was very poor, with only 1 out of 10 (10.4%) of patients with self-reported diabetes having fasting plasma glucose < 6.1 mmol/L and just over a third (34.7%) having HbA_{1c} $< 6.5\%$. The use of prophylactic drug therapies was as follows: 95% of patients were on aspirin or other anti-platelets drugs; 79.8% on beta-blockers; 70.9% on angiotensin-converting enzyme inhibitors (ACEI) or angiotensin II receptor blockers (ARA-II); and 78.1% on statins.

One of the objectives of this third survey was to determine whether the practice of preventive cardiology in patients with established coronary disease in EUROASPIRE III has improved by comparison with those countries which took part in EUROASPIRE I and II. The comparison between those 8 countries which participated in all 3 studies III demonstrated a compelling need for more effective lifestyle and risk factor management of patients with CHD.¹² Findings showed a continuing and widening gap between the guidelines and patients' lifestyles in terms of stopping smoking and reducing obesity and central obesity, no improvement of blood pressure control, increased prevalence of diabetes, and at the same time substantial increase in doctors prescribing all of the major classes of cardioprotective drugs.

Over 12 years there has been no reduction in the proportion of coronary patients who smoke (20.3% in EUROASPIRE I, 21.2% in EUROASPIRE II, and 18.2% in EUROASPIRE III), but there has been a large increase in the proportion of younger female smokers. In addition, there has been a substantial increase in obesity and diabetes. In 1995-1996, 25% of patients were obese and 17.4% had diabetes; this rose to 38% and 28%, respectively, in 2006-2007. Further, despite the large increase in the use of all classes of blood pressure lowering drugs, blood pressure management showed no improvement. Three out of 5 patients in all 3 surveys had raised blood pressure (58.1%, 58.3%, and 60.9%, respectively), with nearly three-fifths of all patients on blood pressure lowering medication not achieving the blood pressure goal in the third survey. Although lipid management continued to improve, because of statin therapy, almost half of all treated patients remained above the recommended lipid targets. However, the number of patients with raised cholesterol has more than halved.

Audits of clinical practice, such as the EUROASPIRE surveys, quantify the extent to

which the standards set in the Joint European Guidelines on CVD Prevention are being implemented in everyday clinical practice. EUROASPIRE surveys show a continuing treatment gap between the recommendations and clinical practice, and a considerable potential to improve preventive cardiology care in patients with CHD in Europe. They provide a unique picture of preventive action by cardiologists, other specialists, and primary care physicians in Europe, looking after patients with coronary disease, giving an objective assessment of clinical implementation of current scientific knowledge in Europe. The results show that adverse lifestyle trends of coronary patients are a major cause of concern, with persistent smoking and high prevalences of both obesity and central obesity. Blood pressure, lipid and glucose control are completely inadequate, with most patients not achieving the targets defined in the prevention guidelines. The real task facing all health policy makers, physicians and other health-care professionals working in the field of preventive cardiology is implementation of the guidelines in everyday clinical practice, and the challenges facing this implementation are considerable. There is substantial potential throughout Europe to raise the standard of preventive cardiology through more effective lifestyle intervention, control of other risk factors and optimal use of prophylactic drug therapies in order to reduce morbidity and mortality in patients with CHD. CVD prevention in routine clinical practice is inadequate, with only a third of patients in EUROASPIRE III being referred to and attending prevention and rehabilitation programmes, whilst doctors are prescribing more and more drugs. Coronary patients require comprehensive prevention and rehabilitation programmes, not just revascularisation and cardioprotective medication. Simply giving a prescription is clearly not sufficient and drug treatments need to be combined with professional lifestyle intervention.

It is possible to further reduce the gap between guideline standards and clinical practice by providing a comprehensive programme of preventive care as demonstrated by the European Society of Cardiology's European Action on Secondary and Primary Prevention through Intervention to Reduce Events (EUROACTION) project. The EUROACTION study showed that standards of preventive care across Europe can be improved. It is an example of an integrated approach to cardiovascular disease prevention, set up to close the gap between guideline standards and everyday clinical practice.^{13,14} This cluster randomised controlled trial of a nurse-managed, multidisciplinary preventive cardiology

programme for coronary and high risk patients showed that they, and their families, were more likely to make healthy changes to their diet and physical activity levels, and to have their blood pressure and other risk factors managed more effectively under this programme compared to usual care. EUROACTION is a model of preventive cardiology, which can be used in routine clinical practice. The common challenge for cardiologists, physicians and other health professionals is to go beyond specialised cardiac rehabilitation centres and provide local preventive cardiology programmes, appropriately adapted to the medical, cultural, and economic setting of a country. CVD prevention needs a systematic, comprehensive, multidisciplinary approach, which addresses lifestyle and risk factor management by general practitioners, nurses and other allied health professionals, and a health care system which invests in prevention. Comprehensive lifestyle programmes should be an integral part of health-care provision and health insurance plans for all patients with coronary disease. Saving people's lives from acute heart attacks is not sufficient, and an urgent investment in prevention is needed to address the lifestyle causes of heart disease. As the EUROACTION Study group concluded, "To salvage the acutely ischaemic myocardium without addressing the underlying causes of the disease is futile; we need to invest in prevention."¹²

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