

## Still Much to Aspire Toward in Cardiovascular Prevention and Smoking Cessation

Kotseva K, Wood D, De Backer G, et al; EUROASPIRE Study Group. Cardiovascular prevention guidelines in daily practice: a comparison of EUROASPIRE I, II, and III surveys in eight European countries. *Lancet* 2009;373:929–40.

### Study Overview

**Objective.** To understand whether use of preventive cardiology measures changed across Europe since 1995 and to assess whether recommended practices were being followed in clinical practice.

**Design.** Recurrent cross-sectional national studies across Europe.

**Setting and participants.** European Action on Secondary and Primary Prevention by Intervention to Reduce Events (EUROASPIRE) surveys I (1995–96), II (1999–2000), and III (2006–07) were cross-sectional surveys conducted over a 12-year period in cardiovascular prevention practices in Slovenia, the Netherlands, Italy, Hungary, Germany, France, Finland, and the Czech Republic. Surveys were conducted in the same selected hospitals and geographic areas in these countries by identifying consecutive patients (aged  $\leq 70$  years) who underwent percutaneous coronary intervention, coronary artery bypass grafting, or were admitted to the hospital for acute myocardial infarction or ischemia. Patients were interviewed by trained research assistants at least 6 months after the event, and data collected included demographic characteristics, medication use, and personal and family histories as well as lifestyle behavioral modification advice and therapy on smoking, diet, exercise, weight, lipids, blood pressure, and diabetes. Height, weight, blood pressure, lipid fractions, and plasma glucose were measured. The concentration of exhaled carbon monoxide was measured to determine whether patients were active smokers. Each country aimed to identify at least 400 patients for each round of the study.

**Main outcome measures.** The main outcome measures were the frequency of cardiac risk factors (ie, smoking, overweight/obesity, blood pressure, cholesterol, and diabetes) and medication use over the 3 survey phases. Multilevel hierarchical modeling was used to account for clustering of study participants within countries and hospitals.

**Main results.** 3180 patients were interviewed in the first phase of the study, 2975 in the second phase, and 2392 in the third

phase. Overall participation ranged from 69% to 77%, and the median time from event to study interview ranged from 1.22 to 1.48 years in the 3 survey phases. The overall proportion of patients who smoked remained the same over the 3 surveys (20.3% in phase I, 21.2% in phase 2, and 18.2% in phase III;  $P = 0.64$ ). However, the proportion of women aged younger than 50 years who smoked increased from just under 30% to nearly 50%. The frequency of obesity rose from 25% in the first survey to 38% in the last ( $P < 0.001$ ), and overall nearly 80% of participants were overweight (body mass index  $> 25$  kg/m<sup>2</sup>) by phase III. Rates of elevated blood pressure stayed constant at between 58% and 60% ( $P = 0.49$ ). However, the proportion of patient who reported diabetes increased from 17% in phase I to 28% in phase III ( $P = 0.004$ ). Conversely, the proportion of patients with elevated cholesterol dropped from 95% in phase I to 46% in phase III ( $P < 0.001$ ). The use of cardioprotective medications, such as antiplatelet, blood pressure-lowering, and lipid-lowering medications generally increased between the first and last survey. The increases were most pronounced for statin therapy (67.8% increase;  $P < 0.001$ ), angiotensin-converting enzyme inhibitor/angiotensin receptor blocker therapy (42.8% increase;  $P < 0.001$ ), and  $\beta$ -blocker therapy (27.7% increase;  $P < 0.001$ ).

**Conclusion.** Among European patients who survived an ischemic event or procedure, rates of control for the most important cardiac risk factors generally stayed the same or worsened over a 12-year period. These findings existed despite the fact that medical therapy for many of these risk factors significantly increased over the same time period. The current European strategies for secondary prevention are not working.

### Commentary

Ischemic heart disease remains the leading cause of death in the United States and Europe, even though prevention and treatment options have expanded greatly in the past 2 decades [1]. Because evidence-based guidelines and treatment modalities for preventing secondary cardiac events are well-researched and promoted by a wide range of specialty societies, advocacy groups, public health officials, and

pharmaceutical companies, it might be tempting to conclude that progress is being made in cardiovascular prevention. However, the results of EUROASPIRE III suggest otherwise.

EUROASPIRE researchers found that most key risk factors for cardiac disease, such as blood pressure control, weight, smoking, and diabetes, were not improved at a median of 1.5 years after the initial cardiac event. Even worse, a large increase was found in rates of smoking in women younger than 50 years, as well as raised levels of obesity and diabetes. Only cholesterol control was improved since the initial survey in 1995; yet, cholesterol was not at goal in nearly half of patients.

So, what is the problem? A closer look at how clinicians, and especially cardiologists, perceive risk factor management offers some insights. As EUROASPIRE found, the provision of evidence-based drugs to treat cardiac risk factors has increased significantly in line with increased knowledge of molecular and population effects. Not surprisingly, the use of  $\beta$  blockers, angiotensin-converting enzyme inhibitors/angiotensin receptor blockers, and especially statins increased dramatically over 12 years, and use of antiplatelet therapy, which was already high in 1995, nudged even higher. However, with the exception of cholesterol control, more drugs did not correspond with better risk factor control. Blood pressure targets were not met in nearly 60% of patients, even with higher prescription rates of appropriate medication. Smoking and obesity rates stayed the same or worsened even though proven behavioral and medication prevention strategies exist for both. It appears that the paradigm of cardiac disease control primarily through narrowly aimed pharmaceutical therapy may be inadequate.

The case of smoking cessation in preventive cardiology is illustrative. Great strides have been made in European tobacco control over the last decade in terms of clean indoor air laws, tax increases, and tobacco advertising bans [2]. However, as EUROASPIRE shows, smoking rates have not changed in a group of patients most vulnerable to the deleterious effects of continued smoking. This lack of progress highlights an urgent need for improved smoking cessation efforts. However, cardiologists and other clinicians appear to be less interested in smoking cessation, seeing it as either a lifestyle choice or a difficult psychological intervention beyond the bounds of their clinical training or available time [3]. It would appear that their preferred method of secondary cardiac prevention is through the provision of almost cursory advice for lifestyle modification and the prescription of medications for lipid, antiplatelet, and blood pressure control.

A wide range of evidence suggests the fallacy in this current approach. First, nearly 70% of smokers would like to quit, although only 2% to 3% report success in doing so each year [4]. These figures highlight the extraordinarily addictive nature of tobacco and the need for direct, provider-

based tobacco treatment, even in the setting of anti-tobacco public health environments [3]. Second, the provision of smoking cessation treatment is clinically effective [5], more cost-effective than any medication for secondary prevention [6], and can be practically accomplished in a busy clinical setting [5]. Repeated, direct brief counseling can double quit rates [7], and when combined with a range of approved over-the-counter and prescription medications such as nicotine replacement, bupropion, and varenicline, 1-year quit rates of up to 30% can be achieved [8].

Finally and arguably most importantly, for patients who have had an ischemic event, smoking cessation saves lives and prevents recurrent major events and death at a higher rate than any individual medical treatment. In a randomized controlled trial, Mohiuddin et al [9] found that an intensive behavioral and medication smoking cessation program for smokers who were hospitalized with an ischemic event in the critical care unit tripled quit rates and decreased all-cause mortality by an absolute risk of 9% (77% reduction in relative risk). This drop corresponds with a number needed to treat (NNT) of 11 for smoking cessation to prevent 1 death in the year following a major ischemic cardiac event [9]. How does this compare with other standard therapies that any clinician following the guidelines would be remiss to overlook? According to the Antiplatelet Trialists' Collaborative, for aspirin to prevent death following a primary event, the NNT is 33 based on an absolute reduction of 3.3% [10]; however, some suggest the NNT to avoid mortality is 154 over 2 years [11]. Statin therapy, a hallmark of secondary prevention, has an NNT of 94 over 2 years to prevent mortality [11], although the 4S study suggested that this number drops to 33 after 6 years of treatment [12].  $\beta$  Blockers have an NNT over 2 years of 42 to prevent 1 death [11]. Thus, the comparative benefits of smoking cessation are clear, although its effective provision is lacking. The overall point of comparison is not that smoking cessation should be promoted at the exclusion of other therapies, but rather that it needs to be better integrated into existing practice. The same can be said of obesity management and other lifestyle modification efforts.

How can this be done in an already busy setting? Recent evidence from innovative smoking cessation trials suggests that the key is better clinician training, and a new focus on treating tobacco use as a chronic disease requires team-based systems of care [13,14]. The benefits of smoking cessation are clear for patients such as those in EUROASPIRE. The question is whether clinicians and administrators have the will and systems redesign capacity to implement them.

A few limitations of EUROASPIRE deserve note. First, the patient populations from the participating hospitals and countries were not a randomly identified representative sample. However, given that they primarily were drawn from areas with high-volume centers, this would suggest that the results are overestimates of the effectiveness of

current preventive cardiology practice in Europe. Second, the identification of study populations in the third phase changed slightly from the first 2 phases, as did the analysis of blood glucose measures. However, all other protocols were kept the same and the results appear to be consistent with other studies in the field.

### Applications for Clinical Practice

Current risk factor control for prevention of secondary cardiac events in Europe is significantly lacking. An urgent need exists for complementing existing pharmaceutical therapy provision with systems-based approaches toward reducing key cardiac risk factors such as smoking and obesity. Cardiologists and other clinicians who care for ischemic heart disease patients need to reinvigorate their efforts toward preventing secondary events by recognizing the shortcomings of current strategies and creating team-based approaches to improve prevention.

—Review by Asaf Bitton, MD

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