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Circulation: European Perspectives in Cardiology

A View From Prague

Michael Aschermann, MD, departmental head at the Cardiovascular Centre at Charles University in Prague and president of the Czech Cardiology Society, reflects on the development of cardiology in his country.

The beautiful city of Prague, the capital of the Czech Republic, is also called “The Heart of Europe.” Prague was home to Emperor Charles IV, and is the site of the second oldest university in middle Europe (established by Charles IV in 1348). It is also the city where in more modern times Dr Otto Klein was born. He performed right heart catheterisation only three years after Dr Werner Forssman first demonstrated in 1927 that this was possible. The 75th anniversary of the Czech Society of Cardiology was celebrated last year. It was established in 1929 after similar societies in the United States and Germany. The Czech Republic is now a free country, with independence coming after the Velvet Revolution in 1989. It became a member of the European Union in 2004.

The Czech Republic is a country with high rates of cardiovascular mortality, and cardiovascular disease (CVD) is the main cause of death, accounting for 48.8% of total mortality in males and 54.6% in females. But since 1985, there has been a decline in CVD mortality due to a decrease in coronary heart disease and stroke mortality in both sexes. Data from five independent cross-sectional surveys of CVD risk factors conducted in the years 1985, 1988, 1992, 1997-1998, and 2000-2001 in a representative sample of the Czech population, and this probably plays a significant role in the decrease in CVD mortality that is being seen.

The proportion of male smokers is decreasing (from 49.2% to 37.8%), with no change in the prevalence of smoking in females. These observations all indicate a favourable trend in most major CVD risk factors in the period 1985 to 2000-2001 in a representative sample of the Czech population, and this probably plays a significant role in the decrease in CVD mortality that is being seen.

A story of considerable importance is the development of invasive and interventional cardiology in the Czech Republic. The data show that 12 years ago coronary interventions were sporadic. For a population of about 10 million, there were only 5 centres, and they dealt with about 40 cases per million inhabitants each year. But now in 2005 we have 20 percutaneous coronary intervention (PCI) centres performing 2120 interventions per million of the population each year. The success of the PRAGUE 1 and PRAGUE 2 studies (together with DANAMI-2 and other trials) have brought us a new approach to acute myocardial infarction (MI) treatment. All patients diagnosed early are admitted or transferred immediately to PCI centres for primary intervention 24 hours a day. Cardiac surgery is performed in 12 centres, and 2 of these have cardiac transplant programmes. Great strides have been taken in the diagnosis and treatment of arrhythmias, implantable cardiac defibrillators, and biventricular pacing, and we have already started with mechanical heart support systems. Research is ongoing in several fields, including cooperation with the Texas Medical Center in Houston, Tex, the Mayo Clinic in Rochester, Minn, and with the University of Iowa in Iowa City. Researchers in the Czech Republic have already started two projects involving early use of stem cells after MI in patients with left ventricular dysfunction.

Finally, it is necessary to mention that the fight for financial support of medical care is a never-ending story in our country, as it is in the whole world. To win this war is probably impossible, but we have so far definitely won several important battles.

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References
Heart Services in England

Roger Boyle, FRCP, national director for heart disease at the Department of Health in London, reviews 5 years of progress with Philippa Pigache.

In June 2000, Senior Cardiologist Roger Boyle was appointed to lead the British government’s fight against heart disease, a position labelled in the media as the “Heart Tsar.” At the same time, the Department of Health (DoH) in London launched its National Service Framework (NSF) for Coronary Heart Disease, a blueprint for nationwide cardiac services to be delivered during the next 10 years. The home nations of the United Kingdom (Scotland, Northern Ireland, Wales, and England) each have separate departments of health, and the one in London (and its ministers) is responsible only for healthcare in England.

The NSF covers health promotion and disease prevention as well as treatment and rehabilitation. Dr Boyle, a consultant since 1983 in York in the north of England, had been one of a group of independent experts who helped the DoH to draw it up. Now halfway into the lifespan of the NSF, Dr Boyle believes that considerable advances in prevention of cardiovascular disease have been made. “Smoking prevalence has fallen from 28% to 25%,” he said. “Advertising of tobacco has been banned, and plans are in place to reduce smoking in public places. A hard-hitting advertising campaign has increased public awareness of the link between smoking and heart disease.” He points out that the government has introduced a “Five-a-Day” scheme to encourage consumption of fruit and vegetables, and nearly 2 million children aged 4 to 6 receive fruit at school as part of a school scheme. The government is also working with industry to reduce the salt content of some foods.

He went on, “There is evidence, too, of improved treatment and survival. Mortality rates from cardiovascular disease are falling at about 4% each year and the target of a 40% reduction by 2010 is likely to be achieved 5 years early due to a combination of healthier life styles and better treatment. Prescribing of statins has increased so exponentially that the number of lives saved each year has risen from 2900 to 9000. Over £2 million is spent each day on statin prescriptions. A national public access to cardiac defibrillation scheme has been established, in which 3000 automated external defibrillators have been positioned in public places and lay people trained in their use. So far 68 patients have survived long enough to be discharged from hospital following out-of-hospital cardiac arrest.

“Referral rates to cardiologists from primary care have risen from 66 000 each quarter to 110 000. Nevertheless, 90% of new angina referrals are seen within 2 weeks in a national network of rapid access clinics. Historically, waiting times for heart surgery have been unacceptable in England. Now patients who previously waited up to 2 years are being treated within 3 months, with similar maximum waits for angioplasty patients. The government has invested £780 million in building the capacity of the cardiac centres to meet the growing demand, and together with the National Lottery Fund, £125 million has been invested in 90 new catheter laboratories across the country.

“There have been major changes in the treatment of heart attack,” Dr Boyle continued. “Eighty-five percent of patients are thrombolysed within 30 minutes of arrival at hospital, and 60% are being treated within 60 minutes of a call for help. Increasing numbers of patients are being treated by ambulance crews prior to reaching hospital. A national pilot of primary angioplasty as an alternative to thrombolysis is underway, and a team of researchers has been appointed to assess the feasibility and cost-effectiveness of such an approach in England. Units at the Hammersmith Hospital in London and another in Southampton are already carrying out primary angioplasty, and the DoH is funding two new cardiac centres. One is in Wolverhampton, in the Midlands, which is already open and treating patients, and another in Basildon, Essex, is due to open in 2007.

“Overall, high technology cardiac interventions are increasing,” said Dr Boyle. “The National Institute of Clinical Excellence (NICE) — the body that reviews the evidence for new medical treatment in England — is shortly to report on implantable defibrillators and biventricular pacing. The rate of implantable cardioverter defibrillator insertion is now 50 per million in England. This meets the existing recommendation of the National Institute for Clinical Excellence, but activity is still rising.”

Dr Boyle went on, “The heart transplant programme continues, with 5 centres in England performing up to 250 operations a year. The number of procedures is falling due to a shortage of donors; this itself is partly down to improved survival from acute brain injury and fewer major motor accidents.”

Regarding cardiologists in England, the director says that numbers have increased by 60% (from 467 to 739) over the last five years, with the goal of doubling the number by 2010. In this time, training posts in cardiology have increased by more than 80%, and the training curriculum has been developed so that it is more modular- and competency-based. The details of a “run-through” training are being explored with the Modernising Medical Careers team and the British Cardiac Society. The DoH is working with primary care and cardiology colleagues to develop general practitioners with a special interest in cardiovascular medicine. These doctors would act as champions for heart disease in their local communities. Dr Boyle claimed that the investment in heart disease seen over recent years means that the United Kingdom now spends more per capita on heart disease than any other nation in the European Union.

Philippa Pigache is a medical science writer based in Sussex, United Kingdom.
Heart valve replacement is the most common surgical treatment for end-stage valvular heart disease, and one major drawback of all heart valve replacements is their lack of the ability to grow. This is especially significant in children, who often need repeated surgical interventions that expose them to additional morbidity and mortality. Replacement valves in current use, whether mechanical or from human or animal donors, also lack repair or remodelling capability once implanted.

Dr Gregor Zünd works closely with Simon P. Hoerstrup, MD, at the Department of Surgery at Zurich University Hospital in Switzerland. They have set themselves the task of solving this problem. By using human tissue engineering techniques, they are focusing on the in vitro generation of a functional, living semilunar heart valve replacement in the laboratory using a patient’s own cells, which, once implanted, should grow with the patient and not need replacing. Furthermore, following promising results from animal trials, Dr Zünd hopes that it may be possible to carry out the first transplant of a living heart valve into a human patient within the next few years.

Dr Zünd did not originally intend to become involved in research. After studying medicine at the University of Berne in Switzerland and spending a year at the Baylor College of Medicine’s Texas Medical Center in Houston, Tex, he settled into a career as a cardiovascular surgeon. Although he enjoyed this clinical work, he became increasingly interested in new technologies in cardiovascular surgery. “In doing daily cardiovascular surgery clinics, time is limited for innovations and new ideas,” he explained. “The impetus to do something more came from the experience that particularly in children with congenital heart defects, the currently available prostheses cannot grow with the patients. This motivated me to focus fully on research.”

In 1994, he was given a grant by the Swiss National Foundation that enabled him to go to Harvard Medical School in Boston, Mass, for two years. Working with Joseph P. Vacanti, MD, one of the pioneers of tissue engineering research, Dr Zünd was part of the team that first successfully transplanted a heart valve leaflet that had been engineered from its cellular components into a sheep. On his return to Zurich, Dr Zünd maintained an interest in cardiac tissue engineering while continuing his work as a surgeon. But finally, in 2001, he decided to focus, and devote his energies to full-time research. He said, “If you want to perform efficient research, you have to concentrate on it 100%. Such a concept cannot be optimally realised with a clinical occupation. For these reasons I stepped out of daily clinical routine.” Although he has spent some time working abroad, Dr Zünd has chosen to live and work for the most part in his native country because he feels that it offers unparalleled support for research and innovation. “Traditionally, Switzerland has no major natural resources, and therefore is focused on know-how. Consequently, the Swiss government is very supportive of research that will lead to new technologies and techniques that can be used in industry.”

Dr Zünd’s work has already won him several awards, including, together with Dr Simon P. Hoerstrup, a first prize for Best Innovation in 2004 from Technopark Zurich, a prominent research and development centre in Switzerland. Meanwhile, the search for improvements continues, such as for the optimal scaffold material on which to grow valvular tissue, the use of stem cells, and bioreactors designed to stimulate tissue development.

In his capacity as head of research at the University Hospital, Dr Zünd promotes clinical research activities covering the full spectrum of medical disciplines. His main focus, however, is still in cardiovascular research. He admitted that he has a tendency to think about his work even when he is away from the laboratory. “My dreams are very much related to my work. I feel responsible for coming up with the therapeutic techniques that will be used by the next generation.”

Emma Baines is a clinical news reporter and freelance writer.

The opinions expressed in Circulation: European Perspectives in Cardiology are not necessarily those of the editors or of the American Heart Association.

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Clinical Trials Update

David Loshak, BA, examined some current and ongoing studies and spoke to some of the physicians involved.

Czech Statin Study Launched

Cardiologists in the Czech Republic have launched the first controlled clinical trial to evaluate the benefits of statin therapy started immediately on hospital admission for acute coronary syndrome (ACS). Discussing the multicenter, randomized, double-blind, placebo-controlled Fluvastatin in the therapy of Acute Coronary Syndrome (FACS) study, lead trialist Petr Ostadal, MD, of the Department of Cardiology at Charles University in Prague, said that it was based on pilot study findings by his group that showed cerivastatin brought “highly significant reductions” in inflammatory markers.

The study is enrolling 1000 high-risk patients to ensure adequate power to detect a significant benefit of fluvastatin 80 mg daily (n=500) versus placebo (n=500) with respect to the primary endpoint (a 30-day decrease of C-reactive protein and interleukin-6) and the combined secondary endpoint (death, nonfatal myocardial infarction, recurrent symptomatic ischemia, urgent revascularization, and cardiac arrest). Dr Ostadal hopes the FACS study will demonstrate reduced inflammation, improved prognosis, advance therapeutic strategies, and offer new indications for statins.

Severe Syncope Aided by Implantable Recorder

Italian researchers report that the integration of early diagnosis and the use of an implantable loop recorder (ILR) allow effective specific therapy in patients with recurrent suspected neurally-mediated syncope. Michele Brignole, MD, of the Arrhythmologic Centre, Ospedali del Tigullio in Lavagna, Italy, said that in the International Study on Syncope of Uncertain Etiology-2 (ISSUE-2), this strategy has been shown for the first time to safely lead to “major reductions” in some forms of recurrence: 80 per cent in the one-year rate, and 92 per cent of total syncope burden. ISSUE-2 was a prospective observational study enrolling 442 patients from centres across Europe and the United States, and was presented by Dr Brignole on September 5 in a Hot Line session at the European Society of Cardiology Congress 2005, in Stockholm, Sweden.

Patients in the study had 3 or more clinically severe syncopal episodes over 2 years, and no significant ECG or cardiac abnormalities. After ILR implantation, patients were followed until the first syncopal episode: Forty-seven received a pacemaker because of asystole, 6 had antitachyarrhythmia therapy, and 50 had no specific therapy. Syncope recurrence was determined subsequently by observation.

Perindopril and Cardiac Remodelling

The Perindopril and Remodelling in Elderly with Acute Myocardial Infarction (PREAMI) study has found that perindopril, an ACE inhibitor with high tissue affinity, confers “significant benefit” in cardiac remodelling. “This could benefit millions of elderly post myocardial infarction patients,” said lead investigator Roberto Ferrari, MD, who is chief of cardiology at the University Hospital of Ferrara in Italy, “especially as progressive cardiac remodelling could silently appear after the acute phase even in heart attack survivors with preserved left ventricular function.”

PREAMI is a randomized, double-blind study that involved 1252 patients (average age 73 years, left ventricular ejection fraction ≥ 40%) at 109 centres in Greece, Hungary, Italy, Romania, and Spain. At 11±4 days post myocardial infarction, patients received perindopril 4mg/day or placebo for one month, followed by 8mg/day for 11 months. Conventional therapy was also given. Perindopril was associated with a 38% relative risk reduction (p<0.001) in the combined primary endpoint (death, hospitalisation for heart failure, and cardiac remodelling). There was significantly less (p<0.001) LV remodelling with perindopril (28%) than placebo 51%.

For further information, visit http://www.escardio.org/knowledge/congresses/CongressReports/clinical/2005/Ferrari.htm

Forthcoming European meetings

The 15th World Congress in Cardiac Electrophysiology and Cardiac Techniques (Cardiostim) will take place from 14-17 June 2006 in Nice, France. Cardiostim is a major world meeting on the latest developments in cardiac electrophysiology, pacing, arrhythmias and related technologies. For more information, visit www.cardiostim.fr

The European Association for Cardiovascular Prevention and Rehabilitation will hold its main annual meeting, EuroPrevent, from 11-13 May, 2006. It will be held at the Hilton Hotel in Athens, Greece. For more information, contact info@europrevent2006.com