The RHASP Project

Prof Eoin O'Brien *and* ***Dr Alice Stanton*** *present the preliminary results of the RHASP (Reduction of Heart Attack and Stroke through Prevention) Project: a unique collaboration between hospital and primary care*

IRELAND has one of the highest death rates from heart attack and stroke in the world (see Figure 1). Despite efforts to hold back the growing epidemic of cardiovascular disease, the evidence is that, while Ireland is reducing morbidity and mortality in common with many other European countries, it continues to have an unacceptable burden of cardiovascular disease. One explanation is simply that we have not been targeting people at high risk of heart disease and stroke because we simply do not know who these people are. It follows that we are not providing the intensive management needed to prevent these medical catastrophes.

The RHASP (Reduction of Heart Attack and Stroke through Prevention) pilot project, which is supported by the Department of Health as part of the Cardiovascular Strategy, has established electronic communication between the *dabl*® database at Beaumont Hospital and six general practices so that high-risk patients can be identified — both in the hospital and in general practice — and be provided with best management.

Rationale for RHASP

The prescribing of drugs for secondary prevention can have a dramatic effect on the occurrence of cardiovascular events (see Table 1).

The ADAPT Centre at Beaumont Hospital is a regional centre for the Anglo-Scandinavian Cardiac Outcomes Trial (ASCOT), which — with 19,342 high-risk hypertensive patients from the UK, Ireland and Scandinavia — is one of the largest ever international studies on cardiovascular event prevention. ASCOT is comparing the effects on coronary events of lowering blood pressure with calcium antagonists and ACE inhibitors versus beta-blockers and diuretics, and of cholesterol lowering in hypertensive patients.

The interim results of this study provide interesting data. First, the Lipid Lowering Arm of the trial had to be closed after 3.3 years because it was deemed unethical to continue; a reduction of total and LDL cholesterol of just 1mmol/l in the 5,000 patients receiving 10mg of atorvastation daily had resulted in nearly 40 per cent less myocardial infarctions and nearly 30 per cent less strokes than in the 5,000 patients receiving placebo.

The Blood Pressure Lowering Arm of ASCOT continues in nearly 20,000 patients, and at 2.5 years after randomization, blood pressure levels have been reduced by 23/14 mmHg. It may be anticipated that the additive effect of blood pressure lowering will be a reduction of cardiovascular events of the order of 50 per cent or greater. The RHASP project arose from consideration of the paradox whereby dramatic benefit can be achieved in clinical trials, but not in clinical practice.

Aims of RHASP

The primary aim of the RHASP Project is to reduce cardiovascular morbidity and mortality in a cost-effective manner by facilitating prevention of cardiovascular events in the community using computer-assisted assessment and management of cardiovascular risk factors. As the absolute benefits of preventive measures are greatest for those at the top of the queue for stroke and heart attack, these patients must be identified. Cardiovascular patients are stratified using the *dabl*® *Cardiovascular Program* to ascertain the absolute risk of having a coronary heart disease event within ten years — high (risk greater or equal to 20 per cent), medium (risk 10 to 20 per cent) and low (risk less than 10 per cent). The data clearly demonstrates that the RHASP target of at least halving event rates in high-risk cardiovascular patients through evidence-based prescribing of cardio-protective medication and by reducing and maintaining average reductions in blood pressure of 12/8 mmHg and in cholesterol of 0.8 mmol/l, together with lifestyle changes, is realistic and achievable. We estimate that if 20,000 high-risk patients in the Eastern Regional Health Authority were managed within the RHASP program over a ten-year period, this would result in the prevention of 1,500 heart attacks and 750 strokes.

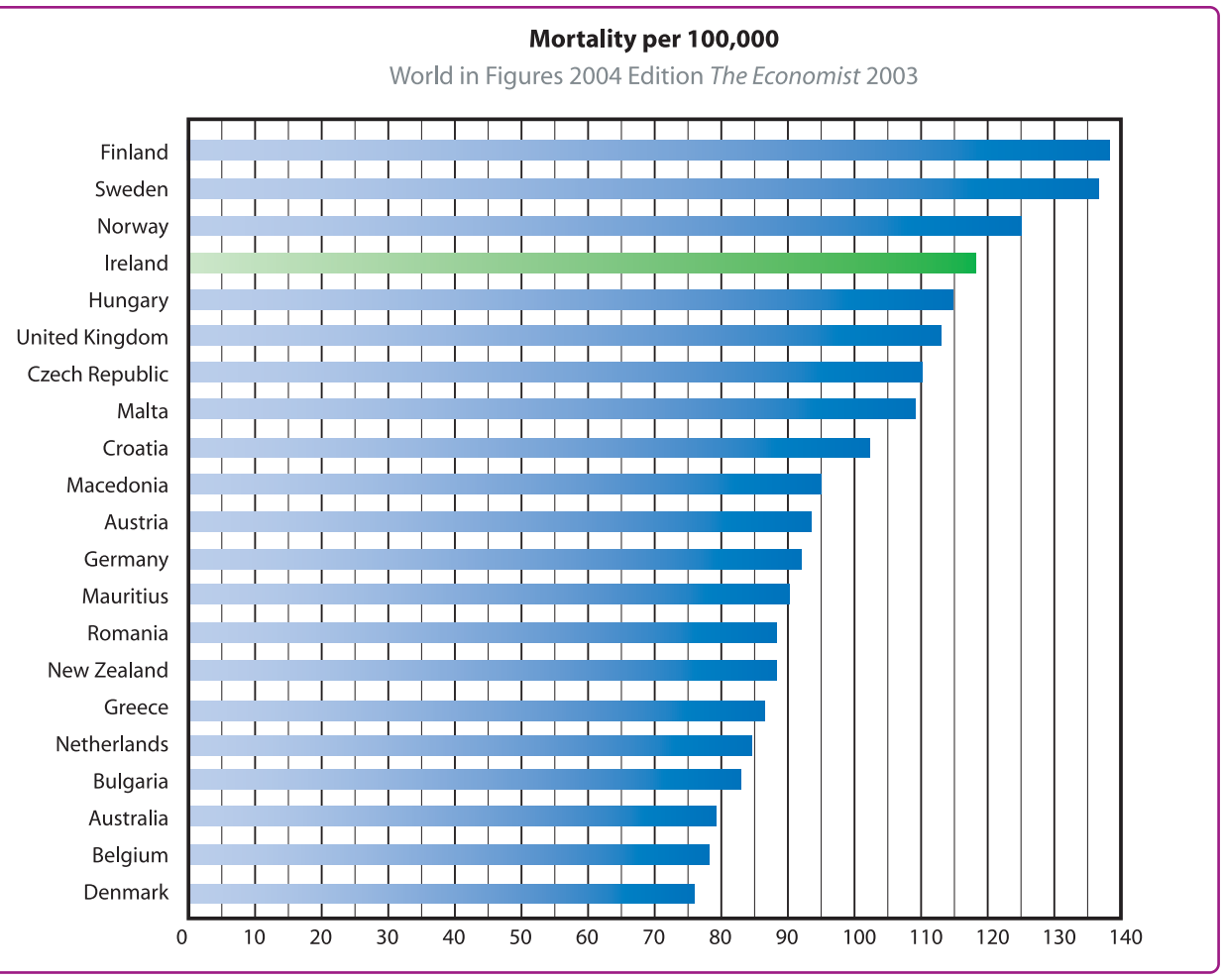

Figure 1: Cardiovascular mortality

Potential cumulative impact of four simple secondary prevention treatments

	Relative risk reduction(%)	One-year event rate (%)
None	—	4.0
Aspirin	25	3.0
Beta-blockade	25	2.25
Statin therapy	30	1.5
ACE inhibition	25	1.15

Cumulative relative risk reduction if all four drugs are used ~ 75%
Smoking cessation halves risk of recurrent MI
Modified from Salim Yusef. *Lancet* 2002

Table 1: Potential cumulative impact of four simple secondary prevention treatments

How RHASP works

The RHASP project is dependent on three fundamental processes:

(i) Nurse-led clinics in hospital and practice;
(ii) Electronic data collection and monitoring of progress; and
(iii) Strict adherence to predetermined targets for treatment in selected patients.

Nurse-led patient management:

All patients in RHASP undergo an initial comprehensive assessment in nurse-led clinics in Beaumont Hospital and in the general practices, which includes: a cardiovascular history of the patient and first-degree relatives; current medication; lifestyle assessment; height and weight; conventional blood pressure measurement; ABPM (ambulatory blood pressure measurement); non-fasting biochemistry, lipid profile, glucose, HbA1c, creatinine and liver function tests. Follow-up assessments take place at two-monthly intervals with investigations being determined by uncontrolled risk factors and interventions at the previous visit. A final assessment is undertaken six months after the initial assessment when a repeat comprehensive cardiovascular risk factor assessment is performed.

Patients are firstly prescribed appropriate medication as shown in Table 2 (see over), and a further guideline advises as to how drug treatment should be adjusted according to the response of serum lipids and blood pressure so as to achieve optimal control. Following initiation of medication, lifestyle advice is provided as shown in Table 3. Finally, a comprehensive report is provided to the patient, general practitioner and hospital physician.

Electronic sharing of data:

Each of the six general practices has been provided with the necessary computer and telephonic facilities to access their patients on the *dabl*® *Cardiovascular* database (which presently contains the records of more than 25,000 patients with cardiovascular disease). The first step in utilizing the electronic link between hospital and general practice was for the practice nurses to perform ABPM using the *dabl*® *Cardiovascular* database. This allowed nurses and doctors in the six general practices to become familiar with the procedure of accessing and receiving information on a remote database via the Internet using a broadband link.

● Continued on page 62

Clinical Feature

The RHASP Project

● Continued from page 61

This electronic facility, which has been used in nearly 300 patients, allows data to be up-loaded from an ABPM monitor and the result assessed electronically from the practices on the *dabl® Cardiovascular* database in Beaumont Hospital. Once this electronic link had been established the practice nurses were then able to apply the risk factor stratification facility to identify high-risk patients with poor control in need of referral to the specialized clinics in Beaumont Hospital.

Patient selection:

There are three groups of patients in RHASP:

Group I: 60 patients from the six selected general practices recently discharged from Beaumont with a diagnosis of a major cardiovascular event (myocardial infarction, stroke or peripheral vascular ischaemia).

Group II: 60 controls for Group I matched for age, sex and cardiovascular event from other general practices.

Group III: 120 patients attending the six selected general practices with known cardiovascular disease or ten-year Framingham cardiovascular disease risk greater than 20 per cent, who would previously have been considered for referral to the Beaumont cardiovascular clinics.

Interim RHASP results

Patient recruitment:

Group I patients — recruitment commenced in June 2003 and all 60 patients were recruited by December 2003.

Group II patients — 60 patients from general practices other then the participating practices have been matched to the patients in Group I and are presently being given comprehensive risk factor assessment and management.

Group III patients — recruitment commenced in August 2003 and, to date, 19 patients with known cardiovascular disease and 12 patients at high risk have been recruited by the six general practices.

Drug prescribing:

A preliminary analysis of the first 24 patients in Group I at two to four months shows that there has been a substantial improvement in the numbers of patients receiving medication, and if this trend is continued for the remaining 36 patients in the Group, a significant reduction in stroke and heart attack may be anticipated (see Table 4).

Risk factor control:

A preliminary analysis of the first 24 patients in Group I at two to four months shows that blood pressure control has been reduced 7/8mmHg (RHASP goal 12/8mmHg) and total cholesterol has been reduced by 0.62mmol/l (goal 0.8mmol/l) and LDL cholesterol by 0.48mmol/l. Over the next six months, it is likely that the RHASP targets will be achieved with the anticipated reduction in stroke and heart attack (Table 5).

- Healthy lifestyle booklet to be given to all
- Discuss diet (calories, fat content, salt content)
- Discuss alcohol
- Discuss salt intake
- Discuss regular exercise
- If smoking, offer referral to smoking cessation officer
- If body mass index greater than 30kg/m^2, offer referral to dietician

Table 3: Non-pharmacological management of risk factors

	Baseline	2-4 months
Statin (adequate dose)	12 (50%)	24 (100%)
Aspirin/Clopidogrel	24 (100%)	24 (100%)
ACE-inhibitor	11 (46%)	23 (96%)
Beta-blocker	15 (63%)	16 (67%)
All four drugs	4 (17%)	15 (63%)

Table 4: Drug prescribing in Group I patients

Evaluation of RHASP

The RHASP Pilot Project is possibly unique in that it has established a strong collaboration between primary care, secondary care, the Department of Health and private enterprise. The indications to date are extremely positive for the patients, clinicians, and the Department. The original clinical goals are being achieved; the pilot is within its time frame and budget. However, to maintain the standards of best practice, the RHASP Pilot will be evaluated by an independent assessor — Prof John Cairns, Professor in Health Economics, Health Economics Research Unit, Aberdeen University. The RHASP Pilot Project in Ireland is being studied by a number of European countries as an example of the way forward. With positive results already evident, one European country has commenced the process of implementing the RHASP model using the *dabl® Cardiovascular* Management System.

If the RHASP pilot study is successful, it will be extended, as appropriate, to a wider study involving other hospitals and general practices. It may well be that RHASP will provide a model for managing cardiovascular disease throughout Europe.

Select bibliography

O'Brien E, Bouchier-Hayes D, Fitzgerald D, Atkins N. The arterial organ in cardiovascular disease: ADAPT (arterial disease assessment, prevention, and treatment) clinic. *Lancet* 1998;352:1700-1702

Sever P, Dahlof B, Poulter N, Wedel H, Beevers G, Caulfield M, Collins R, Kjeldsen S, McInnes G, Mehlsen J, Nieminen M, O'Brien E, Ostergen J, Rationale, design, methods and baseline demographic data of participants in the Anglo-Scandinavian Cardiac Outcomes Trial. J *Hypertension* 2001; 19: 1139-1147

Yusef S, Two decades of progress in preventing vascular disease. *Lancet* 2002; 360:2-3

O'Brien E, Ambulatory blood pressure measurement is indispensable to good clinical practice. Br J *Cardiol* 2003; 10:110

Sever PS, Dahlöf B, Poulter NR, Wedel H, Beevers G, Caulfield M, Collins R, Kjeldsen SE, Kristinsson A, McInnes GT, Mehlsen J, Nieminen M, O'Brien E, Östergren J, for the ASCOT investigators. Prevention of coronary and stroke events with atorvastatin in hypertensive patients who have average or lower-than-average cholesterol concentrations, in the Anglo-Scandinavian Cardiac Outcomes TrialóLipid Lowering Arm (ASCOT-LLA): a multicentre randomised controlled trial. *Lancet* 2003;361:1149-1158

Prof Eoin O'Brien and Dr Alice Stanton, ADAPT Centre, Beaumont Hospital and Department of Clinical Pharmacology, RCSI on behalf of the RHASP participants: Department of Health, Irish College of General Practitioners, dabl Ltd., Artane Family Practice, Beaumont Park Clinic, Fairview Health Clinic, Glasnevin Family Practice, Mountjoy Family Practice and Raheny Surgery

	Baseline	2-4 months
Clinic SBP	131	124
Clinic DBP	82	74
Total cholesterol	4.54	3.92
LDL cholesterol	2.25	1.77
Smokers	8 (34%)	8 (34%)
HbA1c > 7%	3 (12%)	2 (8%)
Weight (kg)	82.0	81.7
Salt (added at table)	14 (60%)	7 (30%)

Table 5: Risk factor control in Group I patients

Evidence-based prescribing for patients with proven symptomatic vascular atherosclerosis (coronary artery disease, cerebrovascular disease, peripheral vascular disease), or with non-insulin-dependent diabetes mellitus

If not on	Check for previous intolerances contraindications or potential drug interactions	Commence	Warn of potential allergy and drug specific side effects	Arrange prior to next visit
Statin	Severe liver dysfunction On a fibrate, (Gemfibrzil, Fenofibrate)	A STATIN e.g. Atorvastatin 10mg daily	Myalgia, LFTs abnormalities	LFTs
Aspirin or Clopidogrel	Bleeding tendency Peptic ulcer disease Sever uncontrolled hypertension Warfarin	Aspirin 75mg daily or Clopidogrel 75mg daily in the presence of dyspepsia	Bleeding Dyspepsia	—
ACE-inhibitor or Angiotensin receptor blocker	Renal artery stenosis Angioedema Potassium supplementation or potassium sparing diuretic	An ACE-INHIBITOR e.g. Ramipril 5mg of if ACE-inhibitor intolerant an AT_2 RECEPTOR BLOCKER e.g. Candesartan 4mg daily	Cough Kidney impairment Potassium accumulation Angioedema	Cr, Na, K
Beta-blocker (only for those with proven coronary heart disease)	Asthma Heart block Symptomatic cardiac failure	A BETA-BLOCKER e.g. Atenolol 50mg daily	Bronchospasm Slowed heart rate	

No more than two new drugs or two dose increases in one visit. If side effects occur, consider dose reduction, drug substitution, or discuss with physician

Table 2: Prescribing procedures