Shared care can help prevent heart disease

Eoin O'Brien and Alice Stanton report on the RHASP pilot study, which set out to assess whether a collaborative hospital/primary care venture could reduce CVD mortality

CARDIOVASCULAR DISEASE, including heart disease, stroke and related diseases, is the single largest cause of death in Ireland, representing over two in five (43%) of all deaths. By comparison, 26% of deaths are caused by cancer.[1] Although deaths from cardiovascular disease in Ireland have been decreasing since 1985, they remain high, at 176/100,000 of the population compared with the average EU figure of 108/100,000.

It has been estimated that if we prescribed the antithrombotic, blood pressure and lipid lowering vascular protective drugs at our disposal, heart attack and stroke could be reduced by over 70%.[2] If endorsement for this statement is needed, we need look no further than the lipid lowering benefit of atorvastatin in the ASCOT (Anglo Scandinavian Cardiac Outcome Trial) which reduced heart attack by 38% and stroke by 27%.[3]

Five hundred patients in Beaumont Hospital had benefited by being managed in this way, and with the blood pressure arm of ASCOT having been closed prematurely because of benefit of one treatment strategy, it can be anticipated that a reduction of at least 50% in stroke and heart attack will have been achieved for patients in ASCOT.

RHASP project

The RHASP project (Reduction of Heart Attack and Stroke through Prevention) was based on the premise that if such effective management was possible in a specialised unit, why not also extend the benefit to patients in primary care? If evidence-based drug management of high risk patients could be agreed and achieved between a specialised centre and primary care, then a model would be available for an innovative national approach to the management of cardiovascular disease.

The RHASP pilot study has, in fact, been proven to be capable of achieving its objectives. John Cairns, professor of Health Economics at the London School of Hygiene and Tropical Medicine – who was commissioned by the Department of Health and Children to provide an independent assessment of the RHASP pilot project – concluded that the project was not only good value for money but that it supports the prevention, treatment and management of cardiovascular disease in the appropriate healthcare sector.[4]

He concluded that RHASP is a working example of a positive collaborative venture between primary and secondary care that utilises service provider skills, healthcare resources and drug treatments to optimum effect. He goes on to suggest: "having regard to all the relevant considerations, including the fact that Heartwatch is already well established in terms of participating numbers, it is recommended that all the parties involved give consideration to selecting a number of Heartwatch practices which would use the RHASP ICT model to allow for a proper empirical test of the possible synergies that could benefit Irish healthcare as a whole".[4]

Table 1

Drug regimens for RHASP

If patient not on:	Commence:
• Statin	• A statin, eg. atorvastatin 10mg daily
• Aspirin or clopidogrel	• Aspirin 75mg daily or clopidogrel 75mg daily, in the presence of dyspepsia
• ACE-inhibitor (ACI) or Angiotensin Receptor Blocker (ARB)	• ACI, eg. ramipril 5mg or if ACI intolerant an ARB, eg. candesartan 4mg daily
• Beta-blocker (only for those with proven coronary heart disease)	• Beta-blocker, eg. atenolol 50 mg daily

Objectives of RHASP

The primary objectives of the RHASP project were:

- To provide a means to reduce cardiovascular morbidity and mortality through a collaborative venture with local general practices utilising computer assisted assessment and management of cardiovascular risk factors
- To affect and maintain a reduction of clinic blood pressure of 12/8mmHg and serum cholesterol of 0.8mmol/l – reductions that might be expected to halve coronary event rates in high risk patients.

Preparatory steps for the RHASP project

The following essential infrastructural steps had to be put in place:

- Six general practices in the Beaumont Hospital catchment area were selected on the basis of having at least basic computer facilities, a practice nurse, the willingness to adhere to evidence based protocols of management for drug treatment and agreement to provide advice on risk factor management
- A nurse-led team had to be established consisting of a specially trained nurse coordinator in the Blood Pressure Unit at Beaumont Hospital, and a nurse practitioner in each of the six practices that would ensure that the agreed protocols (see the example in *Table 1*) were implemented, thereby allowing a uniform policy of management for cardiovascular disease between the Blood Pressure Unit at

Beaumont Hospital and general practice

- The existing computer facilities in the general practices had to be assessed and upgraded when indicated
- Broadband electronic communication had to be established between the Blood Pressure Unit and each general practice so that the nurses (and doctors) in the general practices and the coordinating nurse and supervising doctor in the Blood Pressure Unit could utilise the 'dabl Cardiovascular' program, which has been certified to meet the national GP software certification standard[6]
- Each practice was provided with a 24-hour ambulatory blood pressure monitoring (ABPM) device – 'Meditech ABPM'[7] – which allowed the nurses to become familiar with uploading the data from the ABPM device to the shared system and receiving an immediate electronic report, which interpreted the ABPM recording.[6]

Methodology of RHASP

Two groups of patients were selected:

- Group I: Sixty-one patients attending the six selected general practices recently discharged from Beaumont Hospital with a diagnosis of a major cardiovascular event (heart attack; stroke; angiographic evidence of coronary, carotid, peripheral or renal artery disease; peripheral vascular ischaemia) were identified and recalled to attend the Beaumont RHASP clinic for assessment
- Group II: Fifty-eight patients attending general practices other than the six selected practices, were matched with the group I patients and recalled to attend the Beaumont RHASP Clinic six months later than group I patients, for a similar assessment.

Initial assessment

A detailed cardiovascular and family history, current medication, lifestyle, height and weight; conventional and ambulatory blood pressure measurement; non-fasting biochemistry; lipid profile, glucose, HbA1c, creatinine and liver function tests and electrocardiography were entered into 'dabl Cardiovascular' and printed on the 'dabl Cardiovascular' flow chart, allowing a summary report to be automatically generated.[8]

Any deviations from optimum management were immediately evident to the nurse, who could then instigate appropriate blood pressure, lipid lowering and anti-platelet treatment and lifestyle modification.

Interventions

All patients received treatment according to agreed protocols and appropriate lifestyle advice and counseling. They were issued with a healthy lifestyle booklet followed by discussions on diet in relation to calories, fat and salt. Discussions were also held on the subject of alcohol intake and exercise, whilst patients who were smoking were referred to a smoking cessation officer. If BMI was greater than 30kg/m^2 referral to a dietician was arranged.

Follow-up assessments

Follow-up assessments occurred at two monthly intervals in the blood pressure unit or the patient could attend the GP at any time. Investigations were dependent on uncontrolled risk factors and the interventions of the previous visit. Six months after the initial assessment all patients underwent a repeat comprehensive cardiovascular assessment as for the initial assessment. If at this stage, patients had persistent sub-optimal control of risk factors, they were offered referral to the appropriate specialist risk factor clinic (hypertension, lipid or diabetes).

Table 2

BP, lipids, glycaemic control and lifestyle modification in group I patients

BP (mmHg)	Baseline	Six months	Mean change
Clinic SBP	135	123	-7.7
Clinic DBP	79	74	-4.5
Day time ambulatory SBP	127	121	-5.3
Day time ambulatory DBP	75	72	-3.4
Night time ambulatory SBP	113	108	-6.5
Night time ambulatory DBP	66	61	-4.9
Lipid profile (mmol/l)			
Total cholesterol	4.6	4.2	-0.5
LDL cholesterol	2.5	2.3	-0.2
Glycaemia			
Glycosylated Hb	5.5	5.7	+0.3
Per cent >7%	12	14	+2
Lifestyle			
Smokers n (%)	20 (33%)	18 (30%)	-2 (-3%)
Exercise n (%)	32 (51%)	46 (75%)	+14 (+24%)
Alcohol (units/week)	12	9	-3
BMI (kg/m^2)	28.4	28.5	+0.1
Salt n (%) (added at table)	31 (51%)	18 (30%)	-13 (-21%)

Analysis

The key comparison evaluating the additive value of the RHASP approach was the comparison of lifestyle modification, blood pressure and lipid lowering and drug prescribing between Group I at commencement and final assessment, and with Group II at initial assessment. To ensure that the two groups were not different at baseline, Group I at initial assessment was compared to Group II at initial assessment.

Results

Financial aspects

The financial support for the RHASP pilot provided not only for a detailed assessment of computer facilities in the practices but also for a contribution of €6,500 towards provision of the necessary IT hardware for the project; this sum was in lieu of any direct fee for patient treatment.

The direct cost per participating practice (training, 'dabl Cardiovascular' licences, hardware and software upgrades) was approximately €16,000. The total cost of the pilot study came to just under €390,000, which, when balanced against its achievements and the potential for significantly reducing stroke and heart attack, has been judged as good value for money.[4]

IT considerations

In all instances, the computer assessment carried out in

Table 3

Evidence-based vasculoprotective drug prescribing in groups I and II

	Group I		Group II
	Baseline	Six months	Baseline
Statin (adequate dose)	31 (51%)	56 (92%)	42 (72%)
Aspirin/clopidogrel/warfarin	60 (98%)	61 (100%)	48 (83%)
ACE-inhibitor/angiotensin II blocker	25 (41%)	57 (93%)	33 (57%)
Beta blocker	29 (48%)	41 (67%)	36 (62%)
All four drugs	9 (15%)	38 (62%)	19 (33%)
Mean number of drugs	2.37	3.52	2.74

each of the practices prior to commencing RHASP indicated that though there was use of information technology, this was sub-optimal. The overall outcome of the RHASP assessment was a general improvement in the standard and application of computer technology in the general practices.

Electronic sharing of data

The establishment of broadband connectivity between each of the six general practices and the 'dabl Cardiovascular' system at Beaumont Hospital permitted the practice nurses to perform ABPM by uploading data from an ABPM monitor and receiving directly a computer generated interpretive report from the 'dabl Cardiovascular' system in Beaumont Hospital.

Once familiarity with the procedure of accessing and receiving information on their patients using a remote system via the internet had been established, the practice nurses were then able to familiarise themselves with and apply the risk factor stratification facility to adjust the quality of control according to the pre-agreed protocols.

Life style modification

Only modest improvements in lifestyle risks occurred between baseline and the end of the study especially in relation to alcohol and salt consumption and taking exercise (*Table 2*).

Blood pressure and lipid control

There were significant reductions in office and ambulatory blood pressures between visit 1 and 4, reductions in total and LDL cholesterol (*Table 2*).

Drug prescribing

There was substantial improvement in the numbers of patients receiving medication in Group 1 (*Table 3*), which if sustained should lead to a significant reduction in stroke and heart attack.

Many lessons learned

Many lessons were learned from the RHASP pilot study. These may be summarised as follows:

- It is possible to establish electronic links between general practice and a specialised hospital centre
- The standard of IT in general practice is in need of improvement, but there is a strong willingness to update hardware and to make efficient use of innovative management systems
- It is feasible to implement the use of shared evidence-based protocols thereby ensuring that high risk patients receive the most appropriate management and treatment
- RHASP achieved its primary objectives by increasing evidence based prescribing of cardioprotective drugs to bring about and maintain a reduction of blood pressure and cholesterol with the potential to halve the occurrence of stroke and heart attack. On this basis, it may be estimated that if 20,000 high risk patients in the Eastern Regional Health Authority (now HSE Eastern Region) were managed within the RHASP program over a 10-year period, this would result in the prevention of over 1,000 heart attacks and 500 strokes.
- RHASP has shown that it is possible to implement evidence based research in primary care within a remarkably short time. The results of the lipid lowering arm of the ASCOT study showing a 40% reduction in stroke and heart attack in patients receiving a statin were published in t*he Lancet* in 2003[3] and implemented in primary care within one year, whereas it usually takes several years to bring the results of scientific research into practice
- One of the unanticipated lessons from RHASP was the feasibility of conducting a virtual consultation between a hospital specialist and a GP sharing common data on the patient using the 'dabl Cardiovascular' program. This leads to the concept of establishing virtual clinics for the management of cardiovascular disease, an eventuality that would have far-reaching managerial and financial implications for healthcare delivery

Because of the success of the RHASP pilot project, the model should be extended to other computerised practices as recommended by the independent health economist who evaluated the project,[4] possibly utilising the Heartwatch infrastructure. Consideration should also be given to applying the model to other cardiovascular diseases such as heart failure and diabetes.

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References on request