

RESEARCH IN HEART DISEASE

1. RESEARCH FELLOWSHIPS (none current)

2. PROJECT GRANTS

2.1 **Dr. Jacob George, Professors Allan Struthers and C. Lang** Ninewells Hospital, Dundee £82,099 over three years, awarded December 2006

The potential role of BNP pre-screening by GPs to better target rapid access chest pain clinic referrals

Chest pain is very common and can be due to very serious or trivial causes. To differentiate often takes a hospital referral with costly extra tests. A new blood test done in the GPs surgery has the potential to act as a new screening test to differentiate serious from trivial causes of chest pain so that patients with trivial causes of their chest pain can be reassured and spared an unnecessary and worrying hospital referral. This could also save much NHS resources if, as expected, it markedly reduces referral rates.

2.2 **Dr. Gareth Padfield, Dr. Nicholas Mills and Professor David Newby** Royal Infirmary, Edinburgh £19,528 over one year, awarded December 2006

The effect of acute inflammation on endothelial progenitor cell mobilisation and function

Damage to blood vessels leads to formation of fatty deposits in the walls of our arteries and can lead to angina, heart attacks and other problems with the circulation. A layer of cells that lines blood vessels called the endothelium is of vital importance in maintaining a healthy circulation. Endothelial progenitor cells (EPCs) are newly discovered specialized cells, which are released from the bone marrow and travel in the blood stream to injured blood vessels, where they contribute to the repair of damaged endothelium. It is now appreciated that inflammation is instrumental in the development of acute and chronic damage to blood vessels, yet its effect on the function of EPCs and therefore endothelial repair is yet to be discovered. An understanding of the effect of inflammation on EPCs may help to develop treatments to improve healing of damaged blood vessels and to prevent further damage.

2.3 Drs. Graham Hillis, Paul Broadhurst, Andrew Hannah, Gary Small and Anna Choy

Aberdeen Royal Infirmary

£89,329 over two years, awarded December 2005

The acute effects of pacing the interventricular septum on left ventricular contraction:

An echocardiographic study

In many patients, reduced function of the heart muscle is also associated with abnormal timing of cardiac contraction. This may worsen the symptoms of heart failure and restoration of a more normal pattern of electrical activity, and thereby contraction, has been shown to greatly improve symptoms and survival in selected patients. This treatment - called cardiac resynchronisation therapy - involves implantation of a specialised pacemaker. However, this is sometimes a difficult operation. The current study will assess whether an alternate, less complicated, method of pacing the heart may produce similar benefits in selected patients. In addition, in some patients implanting a standard pacemaker for a slow heartbeat may also result in abnormal contraction and worsening symptoms.

2.4 Drs. Alan Japp, David Newby and Andrew Flapan

Department of Cardiovascular Research

Royal Infirmary, Edinburgh

£35,026 over two years, awarded December 2005

Cardiovascular effects of apelin in vivo in man

Heart failure is a very common condition that reduces life expectancy and causes distressing symptoms. New more effective treatments are therefore required. Apelin is a recently discovered hormone, produced by the body, which acts on the heart and blood vessels. When given to rodents, apelin relaxes blood vessels and improves the pumping ability of the heart. These effects would be beneficial in heart failure. The researchers propose to study the effects of apelin on blood vessels and the heart to help determine its potential use in the treatment of patients with heart failure.

- 2.5 Dr. Jehangir Din, Dr. J. Sarma, Professor Keith Fox and Dr. Andrew Flapan**
Cardiovascular Research, University of Edinburgh
£57,293 over two years, awarded December 2004

Platelet and monocyte function in healthy South Asians: Mechanisms underlying increased cardiovascular risk and potential therapeutic targets

South Asians are the largest ethnic minority group in Scotland and have a much higher risk of dying from heart attacks than the general population. This may be due to an increased tendency to blood clotting or thrombosis. The researchers aim to establish which mechanisms of blood clotting are increased in South Asians, and which treatment is most effective at reducing this. This could lead to better treatment and reduced heart attacks for South Asians. The study will also improve their understanding of blood clotting and heart disease, which may result in new treatment strategies for the general population.

- 2.6 Drs. Graham Hillis, B. Croal, El-Shafei, Gibson, Buchan and Cuthbertson**
Department of Cardiology, Aberdeen Royal Infirmary
81,725 over two years, awarded December 2004

Utility of echocardiographic indicators of increased left ventricular filling pressures in risk prediction following coronary artery bypass grafting

Patients who undergo CABG surgery may experience complications. These include irregular heart rhythms that may prolong hospital stay, require extra drug treatment, and increase the risk of stroke. At present, it is difficult to predict which patients may experience adverse outcomes. This study will test whether new ultrasound measures that indicate increased pressures in the heart can help in identifying patients at risk. It will also test how much they add to existing methods.

2.7 Professor Jill Belch, Dr. A. Hill, Professor Annie Anderson, Dr. Rex Brennan, Professor Howard Davies, Drs. Derek Stewart, Margaret McLaren and F. Khan

Vascular Diseases Research Unit, Ninewells Hospital, Dundee
£89,913 over three years, awarded December 2004

Cardiovascular function and intake of soft fruit: Effects of qualitative and quantitative variation in berry antioxidant status

Cardiovascular (CV) disease is responsible for a major proportion of deaths in the Western World. There is evidence that inadequate dietary intake of antioxidants is linked to these disorders. Ingestion of soft fruit in diet is already recognized as such fruits contain phenolic compounds that are likely to exhibit antioxidant functions within the body. However, no one has directly shown how such a diet may produce beneficial vascular effects. Furthermore, no one has determined which type of antioxidant might be best in terms of CV protection. This project aims to evaluate the effects of three different antioxidant-containing fruits on surrogate markers for CV disease, viz dynamic tests of endothelial function, and blood markers for endothelial function in oxidative stress. A no fruit group (flavoured coloured water) will provide a negative control. Most of the proposed tests have been validated by the researchers, and others, as future predictors of vascular events in scientific studies.

2.8 Dr. Naveed Sattar and PROSPER EXECUTIVE

Department of Pathological Biochemistry, Glasgow Royal Infirmary
£59,500 over one year, awarded December 2003

Relevance of inflammation sensitive pathways to stroke, coronary events and cognitive decline in the elderly in PROSPER

The study of blood vessel inflammation and inflammation-related molecules is perhaps the current most exciting and important area in heart disease research. Inflammation is likely also critical to the occurrence of stroke and related cognitive decline and ultimately Alzheimer's disease, but this question requires detailed investigation. The researchers propose to take advantage of one the largest and comprehensive studies anywhere to examine if two key inflammation molecules predict heart disease, stroke and cognitive decline in the elderly. Their results may improve prediction of heart disease, stroke and Alzheimer's, and will guide better ways to prevent such diseases in the future

2.9 Dr. Graham Hillis, Murdoch Norton, Thomas Redpath, Dr. Stephen Walton and Professor Fiona Gilbert

Department of Cardiology, Aberdeen Royal Infirmary
£68,193 over two years, awarded December 2003

Prediction of functional recovery following acute myocardial infarction: A comparison of echocardiography and cardiac magnetic resonance imaging

After a heart attack, the heart muscle may not contract normally. Most commonly, this indicates that the muscle is dead (infarcted). However, in some circumstances, the absence of movement and thickening is transient due to a sudden, severe lack of oxygen (stunned). This muscle has the potential to recover. The differentiation between stunned and infarcted muscle is difficult, but has important implications for outcome, and may also influence treatment. The current study will test the relative and combined utility of ultrasound and magnetic resonance scanning of the heart in this setting.

3. COMMISSIONED/ACTION RESEARCH PROJECTS

3.1 Drs. Sue Gregory and Brian McKinstry

Research Unit in Health, Behaviour and Change, University of Edinburgh
£46,713 over one year, awarded 2005

Heart disease support groups: their role and value

Cardiac support groups exist to offer their members long-term help, with a view to adding value to the assistance they receive from health professionals, family and friends. This study used a number of different research methods to compile an overall picture of how effectively different types of support groups operate, and how they are viewed by members, their families, and the people who organize the groups.

3.2 Dr. Martin Denvir

Department of Cardiology, Western General Hospital, Edinburgh
£25,000 over two years, awarded 2004

Evaluation of the impact of a multi-disciplinary heart failure network on the quality of life of patients and their carers.

Heart failure is increasingly common and results in poor exercise tolerance, breathlessness, fatigue, depression and early death. Management of this condition is optimal using a multi-disciplinary team approach involving specialist nurses, general practitioners, district nurses, pharmacists and palliative care teams. Lay volunteers also have a role to play supporting non-medical needs of patients and their families. The Heart Failure Network in Lothian provides an ideal opportunity to assess the impact on the quality of life of heart failure patients, the results of this study providing vital information to inform the process of development of the service.