UPBEAT-UK: a programme of research into the relationship between coronary heart disease and depression in primary care patients

André Tylee,[1] Elizabeth A Barley,[2] Paul Walters,[3] Evanthia Achilla,[1] Rohan Borschmann,[4] Morven Leese,[1] Paul McCrone,[1] Jorge Palacios,[1] Alison Smith,[1] Rosemary Simmonds,[5] Diana Rose,[1] Joanna Murray,[1] Harm van Marwijk,[6] Paul Williams[1] and Anthony Mann[1]* on behalf of the UPBEAT-UK team

[1]Institute of Psychiatry, Psychology and Neuroscience, King's College London, London, UK
[2]Florence Nightingale School of Nursing and Midwifery, King's College London, London, UK
[3]Weymouth and Portland Community Mental Health Team, Dorset HealthCare University NHS Foundation Trust and Bournemouth University, Dorset, UK
[4]Centre of Adolescent Health, The Royal Children's Hospital, Melbourne, VIC, Australia
[5]Academic Unit of Primary Health Care, School of Social and Community Medicine, University of Bristol, Bristol, UK
[6]Department of General Practice and Elderly Care Medicine, VU University Medical Centre, Amsterdam, the Netherlands

*Corresponding author

Declared competing interests of authors: none

Published May 2016
DOI: 10.3310/pgfar04080

Scientific summary

UPBEAT-UK

Programme Grants for Applied Research 2016; Vol. 4: No. 8
DOI: 10.3310/pgfar04080

NIHR Journals Library www.journalslibrary.nihr.ac.uk

Scientific summary

Background

Coronary heart disease (CHD) and depression are predicted to be the two leading causes of health-related disability worldwide by 2020. In 2007, the annual societal costs of depression in England were estimated to be £7.5B, projected to be £12B by 2026. The King's Fund estimated that £1 in every £8 spent on long-term conditions is for comorbid mental health. Depression is more prevalent in patients with CHD but the nature of this relationship is uncertain. Previous research conducted in secondary care on patients after cardiac events, such as myocardial infarction (MI), has shown that depression post MI worsens cardiac outcome, increasing the likelihood of cardiac events and cardiac-related death. Established treatments for depression, such as selective serotonin reuptake inhibitors and cognitive–behavioural therapy, have only a moderate effect in CHD patients and no effect on cardiac outcomes. There is an ongoing debate about whether or not case finding for depression in CHD should be conducted in GP practices in England and Wales, and whether or not general practitioners (GPs) should be remunerated for this. It is also unclear how GPs should best manage these patients. Furthermore, it is unclear whether or not the association between depression and adverse cardiac outcome seen in secondary care also exists in primary care. There is no knowledge of the long-term outcome of depression in this patient group or whether or not the association with adverse cardiac outcome remains constant over time. GP CHD registers, by their very nature, may represent a population of people who have survived previous cardiac events and hence have a milder, but still progressive, cardiac disorder, allowing various factors to be studied in the prognosis of depression.

Objectives

The UPBEAT-UK study was designed to determine the prevalence, incidence and course of depression in patients on GP CHD registers, and describe the course and pattern of cardiac outcomes (including chest pain, cardiac interventions, MI and cardiovascular mortality) and costs, testing for any association between depression and adverse cardiac outcomes. The UPBEAT-UK study was also designed to elicit the perspectives of patients with CHD and depression, understand the perspectives of their GPs and practice nurses (PNs) about current management, and develop and test the acceptability, feasibility and cost-effectiveness of a new intervention for CHD register patients with chest pain and depression that could be delivered within current primary care practice.

Method

The UPBEAT-UK study consisted of four related work packages:

1. a metasynthesis of previous research and a qualitative study of GP and PN views on current management of patients with CHD and depression
2. a qualitative study of patients' perspectives of their biopsychosocial needs
3. a pilot trial to assess the acceptability, feasibility and cost-effectiveness of an intervention based on nurse-led personalised care (PC) for people with CHD experiencing current chest pain and depression and determine best outcome measures
4. a 3-year cohort study of patients on GP CHD registers to explore prevalence, incidence, course and costs of depression, course and pattern of chest pain and cardiac outcomes, and the relationship between depression and cardiac outcomes.

Setting

Thirty-three GP surgeries in south London.

Participants

Adults aged ≥ 18 years, registered on GP CHD Quality and Outcomes Framework registers. Patients from 16 surgeries were recruited to the cohort study and patients from an additional 17 practices were recruited for the pilot randomised controlled trial (RCT). Patients from the cohort study were recruited for the qualitative study, as were GPs and PNs for the qualitative study of professionals.

Intervention

We applied the Medical Research Council framework for the development of complex interventions to develop an evidence-based intervention informed by patient and clinician preferences and established theory. This was a primary care-based nurse-led PC intervention. Following a face-to-face assessment, nurses trained in behaviour change techniques facilitated patients to address the problems that they perceived as most important to them and which related to their CHD or depression. Existing resources for CHD or depression-related problems were identified and used by nurses. Follow-up was by telephone.

Main outcome measures

- Pilot RCT: acceptability (Patient Satisfaction Questionnaire, participation rates), feasibility (recruitment and randomisation), potential range of effects [Hospital Anxiety and Depression Scale – depression subscale (HADS-D), Rose angina questionnaire], costs and quality-adjusted life-years (QALYs).
- Cohort: depression (HADS-D), chest pain (Rose angina questionnaire) and a range of cardiac outcomes including attendance at rapid access chest pain clinics, coronary artery stent insertion and bypass grafting, MI and cardiovascular death (extracted from the GP records) and costs.
- Data sources: data were obtained from patient interviews, GP records and national and local authority sources.

Results

Metasynthesis and qualitative study of general practitioners and practice nurses

We identified seven qualitative and 10 quantitative studies, none of which concerned depression and comorbid physical illness. It appeared that GPs and PNs were aware of a relationship between mood and social problems but were unsure of their role in addressing this.

General practitioners and PNs considered that distress after a cardiac event resolves spontaneously; if it endured, or became severe, it was treated as depression. Psychosocial problems were viewed as contributing to depression in CHD, but clinicians expressed uncertainty about their role and responsibility in addressing these problems. An individualised approach was favoured, but clinicians were unsure how to achieve this.

Qualitative study of patients

Thirty patients with depressive symptoms on the CHD register, some of whom reported chest pain, were interviewed. A theme of loss, both before and after the onset of CHD, underpinned accounts (e.g. interpersonal loss, loss of health and of control). Participants felt ‘depressed’ by what they perceived

as a 'medicalisation' of loneliness and by the experience of ageing and ill health. Some believed that their GP would not be able to help with their complex health and social issues. Talking therapies and interventions providing social interaction, support and exercise (e.g. cardiac rehabilitation) were thought helpful, whereas antidepressants were not.

Pilot randomised controlled trial

Seventeen practices were approached by the Greater London Primary Care Research Network and all agreed to participate. Practice recruitment was quicker than expected, indicating that a definitive trial would be feasible. Of 3325 patients on CHD registers, 1001 consented to contact, of whom 81 were eligible and randomised (41 intervention, 40 control), although three patients were wrongly randomised as they had no chest pain. Recruitment for a definitive RCT seems promising, although it would be from a large pool of potential participants and randomisation was largely successful. As this was a pilot trial, it was not powered to detect efficacy of the intervention. We therefore do not report *p*-values and report findings, which should be explored further in a definitive RCT. Both groups showed improvement in depression (HADS-D score) at all time points, with mean scores moving from moderate depression at baseline to mild depression at 12 months. A mixed-effects model showed no significant differences between groups over time for any measure of depression and confidence intervals (CIs) were wide, so an effect in favour of either group cannot be ruled out. The most notable difference between PC and treatment as usual (TAU) was in chest pain on the Rose angina questionnaire. The percentage of patients no longer reporting chest pain was 37% in PC versus 18% in usual care at 6 months, and 31% in PC versus 19% in usual care at 12 months. PC participants also made fewer accident and emergency (A&E) visits (24% PC vs. 38% TAU), although missing data concerning the reason for these visits makes this difficult to interpret. Self-efficacy was also improved more in PC. Health economic analyses showed that total costs in the intervention arm were lower than usual care but QALYs were also lower. These differences were not statistically significant. Overall, PC seemed to be acceptable and feasible.

Cohort study

Sixteen south London practices, with 142,648 patients, participated in the cohort study. Of this population, 2% (2938/142,648) were on GP CHD registers. A total of 803, after invitation by GP letter, participated, representing 27% (803/2938) of those on the CHD registers. The mean age of participants was 71 years, 70% were male and 87% were white. Participants reported multiple social problems, multimorbidity and disabilities, including problems with general pain and discomfort (53%, 425/803), poor mobility (49%, 391/803) and difficulties with intimate relationships (38%, 302/803). A total of 573 patients (71.3%) provided complete data to 36 months and a further 136 provided data up to 48 months. The analyses reported here are of data up to 36 months.

Of these patients, 7% had depressive disorder at baseline and 13% had depressive symptoms. There were 12% who had an anxiety disorder comprising: panic disorder (< 1%), generalised anxiety disorder (3%), and mixed anxiety and depressive disorder (8%). Twenty-five per cent of patients had anxiety symptoms yet only 3% of people were recorded as having anxiety in the GP records. The incidence of depression was 130 per 1000 person-years at risk for men and 90 for women, so males were nearly 1.5 times more likely to develop depression. Over 36 months, just over half of patients had a cardiac intervention (e.g. stent insertion or graft), 11% had a MI and 5% of patients died from a cardiovascular cause. Incidence rates of cardiac death were 12.7 per 1000 person-years for men and 9.3 per 1000 person-years for women. Standardised mortality ratios compared with the general population were 1.13 (95% CI 0.62 to 1.90) and 1.87 (95% CI 0.81 to 3.70) for men and women, respectively.

In total, 44% of the cohort complained of chest pain at outset, 66.8% of these being exertional, which is suggestive of angina. Baseline exertional chest pain (Rose category 2) was associated with all cardiac outcomes. For rapid access chest pain clinics, relative risk ratio (RRR) 4.00 (95% CI 1.84 to 8.72); cardiac interventions (RRR 7.51, 95% CI 3.74 to 15.10); MI and cardiovascular death (RRR 3.72, 95% CI 1.54 to 9.01).

Anxiety was an independent predictor of MI and cardiovascular death (RRR 3.93, 95% CI 1.95 to 7.90). Depression did not predict any cardiac outcomes.

We found there were different risk profiles for continued reporting of non-exertional (Rose category 1) and exertional (Rose category 2) chest pain across the 3 years of follow-up. Risk factors for the former were: female sex [odds ratio (OR) 2.80, standard deviation (SD) 7.19], asthma (OR 3.34, SD 1.98) and anxiety (OR 1.33, SD 0.62). Good quality of life was protective (OR 0.98, SD 0.01). For exertional pain, the risk factors were: exertional pain at baseline (OR 28.07, SD 7.14) and anxiety (OR 0.65, SD 0.38). Good quality of life was similarly protective for exertional pain (0.98, SD 0.01).

The average cost over the 36 months for patients with depressive symptoms at baseline was double that for patients without depressive symptoms at baseline. Inpatient services dominated costs at baseline and follow-up. Statistically significant predictors of higher societal costs were: depressive disorder (measured by the Clinical Interview Schedule – Revised), white ethnicity, housing problems, relationship problems, self-reported current cancer and baseline health-care costs.

Conclusions

Nearly half of all patients on GP CHD registers were found to have current chest pain and this was strongly associated with concurrent social problems. Patients who reported chest pain at the outset of the study were more likely to have further chest pain over the following 3 years and to have more adverse cardiac outcomes, such as needing stent insertion, bypass graft surgery, having a MI or dying of a cardiac cause. Although depression was common, episodic and associated with increased costs, anxiety disorder was more common and found to be a stronger predictor of worse cardiac outcome and mortality than depression, so there is a pressing need to better understand this link. More sophisticated models linking the patterns of depression, anxiety and chest pain are needed to understand the associations between anxiety, chest pain and adverse cardiac outcomes. We have a unique cohort data set to allow us to achieve this.

General practitioners and nurses seem currently uncertain how best to manage patients' symptoms in the context of the many psychosocial problems in their CHD patients. PC promoting self-management proved to be acceptable and feasible, improved patient self-efficacy, reduced chest pain and was associated with fewer overall costs than usual care (e.g. fewer A&E attendances). PC combining case management and self-management with an extra emphasis on anxiety needs to be further piloted and definitively tested with PNs, working closely with colleagues in practices. Many nurses told us they had little extra current capacity, so this would need to be built into practice plans. PC combining self-management with an extra emphasis on anxiety could also be piloted and definitively tested with psychological well-being practitioners in Improving Access to Psychological Therapy, although they would need training and supervision in long-term conditions and behavioural change techniques. Future work should explicitly explore methods for effective implementation of the intervention, including staff training needs and changes to practice.

Trial registration

This study is registered as ISRCTN21615909.

Funding

Funding for this study was provided by the Programme Grants for Applied Research programme of the National Institute for Health Research.

Programme Grants for Applied Research

ISSN 2050-4322 (Print)

ISSN 2050-4330 (Online)

This journal is a member of and subscribes to the principles of the Committee on Publication Ethics (COPE) (www.publicationethics.org/).

Editorial contact: nihredit@southampton.ac.uk

The full PGfAR archive is freely available to view online at www.journalslibrary.nihr.ac.uk/pgfar. Print-on-demand copies can be purchased from the report pages of the NIHR Journals Library website: www.journalslibrary.nihr.ac.uk

Criteria for inclusion in the *Programme Grants for Applied Research* journal
Reports are published in *Programme Grants for Applied Research* (PGfAR) if (1) they have resulted from work for the PGfAR programme, and (2) they are of a sufficiently high scientific quality as assessed by the reviewers and editors.

Programme Grants for Applied Research programme

The Programme Grants for Applied Research (PGfAR) programme, part of the National Institute for Health Research (NIHR), was set up in 2006 to produce independent research findings that will have practical application for the benefit of patients and the NHS in the relatively near future. The Programme is managed by the NIHR Central Commissioning Facility (CCF) with strategic input from the Programme Director.

The programme is a national response mode funding scheme that aims to provide evidence to improve health outcomes in England through promotion of health, prevention of ill health, and optimal disease management (including safety and quality), with particular emphasis on conditions causing significant disease burden.

For more information about the PGfAR programme please visit the website: http://www.nihr.ac.uk/funding/programme-grants-for-applied-research.htm

This report

The research reported in this issue of the journal was funded by PGfAR as project number RP-PG-0606-1048. The contractual start date was in August 2007. The final report began editorial review in July 2014 and was accepted for publication in September 2015. As the funder, the PGfAR programme agreed the research questions and study designs in advance with the investigators. The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The PGfAR editors and production house have tried to ensure the accuracy of the authors' report and would like to thank the reviewers for their constructive comments on the final report document. However, they do not accept liability for damages or losses arising from material published in this report.

This report presents independent research funded by the National Institute for Health Research (NIHR). The views and opinions expressed by authors in this publication are those of the authors and do not necessarily reflect those of the NHS, the NIHR, CCF, NETSCC, PGfAR or the Department of Health. If there are verbatim quotations included in this publication the views and opinions expressed by the interviewees are those of the interviewees and do not necessarily reflect those of the authors, those of the NHS, the NIHR, NETSCC, the PGfAR programme or the Department of Health.

Published by the NIHR Journals Library (www.journalslibrary.nihr.ac.uk), produced by Prepress Projects Ltd, Perth, Scotland (www.prepress-projects.co.uk).