Review

Psychology in coronary care

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Summary

Psychological stress has been implicated in the onset and progression of coronary heart disease (CHD). Recent research has highlighted the importance of depression and anxiety as independent risk factors for mortality in cardiac patients. Accordingly, it is critical that clinically significant levels of distress are identified, both in-hospital and after discharge, to target patients who require specific psychological intervention, in addition to conventional cardiac rehabilitation. Ameliorating distress has been shown to improve adherence to treatment advice, such as modifying cardiac risk factors, compliance with medication regimens, and attendance at exercise programmes, which in turn should reduce cardiac morbidity and mortality. The emphasis within cardiac rehabilitation should be on tailoring provision to meet individual patients’ needs.

Introduction

Recovering after a cardiac event has come to the forefront of clinical practice as more lives are saved. Whereas in previous years the emphasis in coronary heart disease (CHD) care was on the acute management of myocardial infarction (MI) and preventing death, substantial medical advances have allowed attention to shift to rehabilitation.¹ Mortality rates from CHD have fallen in the UK since the late 1970s. For example, in British men and women aged 35–44, there was a 35% and 33% fall in the death rate, respectively, while the decline in mortality for men and women aged 65–74 was 18% and 15%, respectively.² About 300 000 people in the UK suffer a MI each year; of these approximately half are fatal.² The incidence rate for reinfarction is almost 5% annually.³ The most recent survey of morbidity statistics by the Royal College of General Practitioners shows a 60% increase for men and a 69% increase for women in the rate of angina between 1981/82 and 1991/92.² Given MI survival rates, the risk of recurrent infarction, the current prevalence of angina, and the increased use of coronary revascularization, substantial numbers of patients could benefit from cardiac rehabilitation.

The outcome for patients who have suffered a coronary event depends not only on the physical characteristics of the event, but also on the type of person they are and how well they adjust psychologically.⁴ Psychological distress, in particular the symptoms of anxiety and depression, is commonly experienced immediately after the onset of MI. While symptoms abate after 5 or 6 days in some patients,⁵ in others distress persists.⁶ The patient’s psychological state can be inadvertently neglected, as cardiologists focus on treating the physical symptoms of CHD.

Cardiac rehabilitation in the UK: current perspectives

Cardiac rehabilitation has changed dramatically over the last five decades. Fifty years ago, patients who
suffered a coronary event were immobilized for 6–8 weeks and encouraged to ‘rest’ for at least a year. The first formal cardiac rehabilitation service was set up in the UK over 25 years ago and, although the value of rehabilitation is now widely recognized, provision is still uneven. The number of cardiac rehabilitation programmes has increased dramatically within the last decade.⁷–⁹ In 1989, a working party report by the British Cardiac Society identified 90 cardiac rehabilitation programmes.⁷ Since then the number of cardiac rehabilitation programmes in the UK has risen to 273.¹⁰ Recent guidelines from the British Association for Cardiac Rehabilitation¹¹ have two key recommendations: that cardiac rehabilitation incorporates the skills of a range of professionals; and that patients receive exercise and group education sessions after an individual assessment of needs. Education should deal with the nature of heart disease, medication, risk factor modification, and include stress management and relaxation, so that patients can participate in their own health care and take responsibility for health management after discharge from hospital.¹⁰

Although these guidelines acknowledge the importance of behavioural and psychological issues, many cardiac rehabilitation programmes have little or no formal psychological input. A survey by Maes¹² revealed that there were only four countries in Europe where more than 20% of patients received any specific form of psychological care in addition to standard medical care and physical exercise training. A recent survey of 25 randomly-selected cardiac rehabilitation programmes in England and Wales found that there was only one psychologist actively involved.¹³ Lewin et al.¹⁰ extended the earlier survey of British cardiac rehabilitation programmes by Thompson et al.¹³ In 70% of programmes, more than five health-care professions were incorporated within the rehabilitation team. However, in only 21% was a psychologist part of the rehabilitation team, and in only 9% did the psychologist directly interact with patients.¹⁰

Psychological risk factors in relation to heart disease

Psychological stress and the cardiovascular perturbations associated with it have been implicated in the development and/or expression of CHD. Although some counter examples exist,¹⁴,¹⁵ a number of studies have implicated large magnitude cardiovascular reactions to stress in a range of cardiovascular risk and disease outcomes: serum lipid levels,¹⁶ cardiac ischaemia,¹⁷ atherosclerosis,¹⁸,¹⁹ and hypertension.²⁰–²² There is also evidence relating abnormalities of haemostasis and coagulation to thrombus formation (thrombogenesis) and the development of atherosclerotic vascular disease (atherogenesis). Psychological distress has been shown to induce an increase in platelet count and activity, and this, in combination with the increased levels of von Willebrand factor (vWF), coagulation factors VII and VIII, and plasma fibrinogen, may have an additive effect in promoting occlusive thrombus formation.²³ In patients with chronic atrial fibrillation, who manifest a hypercoagulable state,²⁴ and are subject to stress, plasma fibrinogen levels and platelet activity are increased, while antifibrinolytic activity is reduced.²⁵ Taken together, such observations suggest that patients who are distressed following a MI are at increased risk of thrombogenic events. Depression is also a risk factor for death or cardiac arrest in patients exhibiting ventricular arrhythmias,²⁶ and the impact of depression on mortality appears to be greater in MI patients with higher rates of premature ventricular extrasystoles.²⁷

Recent research by Frasure-Smith and her colleagues has identified depression as a significant independent predictor of mortality at 6 months in post-MI patients.²⁷–²⁹ They initially interviewed 222 MI patients, 5–15 days following admission to hospital, of whom 16% met DSM-III-R criteria for major depression, and 31% had Beck Depression Inventory (BDI) scores of 10 or more indicating the presence of clinically significant depression.³⁰ At 6-month follow-up, 5% of patients had died; half of them had major depression, suggesting a relative risk associated with depression of 4.29 (95%CI 3.14–5.44) after controlling for other clinical variables including Killip class, previous MI, and prescription of warfarin at discharge. Similar results have been reported by other researchers. Patients classified as having extreme depression while hospitalized for MI were significantly more likely to die in the following 6 months than patients who were not depressed, an effect that remained after controlling for variations in traditional risk factors.³² Evidence also indicates that the depression experienced after a MI is not transient; at 3 months follow-up, 77% of patients who initially met criteria for major depression still showed evidence of depression.³³

History of a major depressive episode has been associated with a relative risk of MI more than four times higher than that among individuals with no such history, in a cohort of people previously free from CHD.³³ MI patients with recurrent depression in hospital were also at an increased risk of death during the following 18 months.³⁴ The effects of depression before and after coronary artery bypass graft (CABG) surgery has also been examined. Of the patients depressed before surgery, 53% were depressed at one month and 47% were depressed at one year,³⁵ whereas of those not depressed before
surgery, 13% were depressed at one month and 9% were depressed at one year post-CABG. Clearly, a patient's pre-operative depression status is an effective predictor of depression postoperatively.35

Other psychological variables have shown prognostic significance during the first year following MI. In particular, anxiety while in hospital increases the risk of recurrent cardiac events, independently of depression.27 Living alone is also associated with poor prognosis after MI.18 There is evidence that social support, whether provided by a partner or others, may serve to buffer the impact of psychological stress, ameliorating distress37 and enhancing physical recovery.38 There is also increasing evidence that one component of the type A behaviour pattern, hostility, may also affect the course of CHD.39,40 For example, higher hostility scores have been associated with increased risk of MI and total mortality, even after controlling for traditional cardiovascular risk factors.40

Finally, it is well-recognized that a MI is often followed by a process of psychological denial. While patients without initial conscious awareness of the nature of their illness have shown good post-MI adjustment,41 persistent denial appears to be related to poor outcomes, with patients ignoring symptoms of an impending cardiac event, failing to seek and comply with medical and rehabilitation advice.4244 Working through the trauma of a cardiac event (approach coping) was associated with reduced long-term emotional distress, although, in the short-term, approach coping was related to increased distress.45

Cardiac rehabilitation and the psychologist

Exercise rehabilitation has been used for both primary and secondary prevention of CHD.46,47 It is well-recognized that exercise reduces a number of the risk factors associated with CHD, including weight, blood pressure, serum triglycerides and total cholesterol.48,49 For example, an overview of 22 randomized trials of exercise rehabilitation with 4554 post-MI patients showed a 20% reduction in overall mortality, reflected in a decreased risk of cardiovascular mortality and fatal reinfarction for at least 3 years and a reduction in sudden death for at least a year after MI.50 A further meta-analysis concluded that cardiac rehabilitation had a beneficial effect on mortality, but not on non-fatal recurrent MI.51

Accumulating evidence indicates that exercise reduces anxiety and depression,5255 independently of changes in aerobic fitness.53 Accordingly, the light exercise programmes typically recommended after a coronary event should reduce depression, irrespective of their effects on cardiovascular efficiency. For instance, CHD patients had lower depression scores following exercise rehabilitation despite no significant improvements in aerobic fitness.56,57 Other psychosocial benefits of cardiac rehabilitation which have been reported include an improved quality of life,58 successful modification of lifestyle in terms of diet, smoking cessation, and reduced alcohol consumption.7

Linden et al.59 performed a meta-analysis of 23 randomized controlled trials that evaluated the additional impact of psychosocial treatment of rehabilitation from coronary artery disease (CAD) in 2024 patients who received psychosocial treatment vs. 1156 control subjects. The psychosocially-treated patients showed greater reductions in psychological distress, systolic blood pressure, heart rate and cholesterol level. Patients who did not receive psychosocial treatment showed greater mortality (adjusted odds ratio of 1.70) and cardiac recurrence rate (adjusted odds ratio of 1.84) during the first 2 years of follow-up.

Psychological intervention programmes that provide short-term support for psychological distress, in conjunction with coronary risk behaviour interventions, coupled with exercise, have a positive influence on both the physical and psychosocial outcome. Studies by Thompson and Meddis60,61 examined the effect of in-hospital counselling by coronary care nurses. They randomly assigned 60 male post-MI patients and their wives to either a treatment group, where they received a simple programme of education and psychological support in addition to routine care, or a control group, which received routine care only. In the treatment group, patients reported statistically significant lower anxiety and depression levels than controls.60 The wives in the treatment group also had significantly lower anxiety levels than wives in the control group.61 Lewin et al.62 evaluated the effects of a comprehensive home-based cardiac rehabilitation programme on psychological distress. Post-MI patients were randomly allocated to a self-help rehabilitation programme based on a heart manual or to receive standard care plus a placebo package of information and informal counselling. The ‘heart manual’ consists of six sections dealt with on a weekly basis, that include education, a home-based exercise programme, and a tape-based relaxation and stress management programme. Psychological adjustment assessed by the Hospital Anxiety and Depression (HAD) Scale63 was better in the rehabilitation group at 12 months. They also had less contact with general practitioners and fewer re-admissions to hospital in the first 6 months post-MI. The improvement was greatest among patients who were clinically anxious or depressed at discharge from hospital.

Bundy et al.64,65 examined the psychological treat-
Management of patients with chronic angina pectoris. Stress management training, particularly in combination with mild exercise, was associated with improvements in symptomatology, reliance on medication, and exercise tolerance relative to routine care. Ornish et al.\textsuperscript{66,67} reported that comprehensive lifestyle changes (including a low-fat vegetarian diet, stress management training, moderate aerobic exercise, cessation of smoking, and group support) can reduce the degree of stenosis of coronary arteries within a year, without recourse to lipid-lowering drugs.

In contrast, three recent studies have found that psychological intervention failed to reduce anxiety, depression, and mortality levels. The rehabilitation programme comprising psychological therapy, counselling, relaxation, and stress management training, yielded no psychological or clinical advantages over routine care in post-MI patients.\textsuperscript{68} In the Montreal Heart Attack Readjustment Trial (M-HART)\textsuperscript{69} patients in the psychological treatment group were phoned monthly to assess distress, and if distressed, visited at home; there was a higher cardiac and all-cause mortality among women receiving the psychological intervention, and the impact on anxiety and depression was minimal. In the final study, patients reporting high levels of stress were also telephoned to assess mood and coping, and referred to a mental health specialist, if warranted. There were no significant differences in depression score from baseline to 12 months between patients in the intervention group and those receiving routine care.\textsuperscript{70}

There are a number of reasons for the failure to find advantages for psychological intervention in these studies. The M-HART programme\textsuperscript{69} and the study by Taylor et al.\textsuperscript{70} differed from most post-MI psychological rehabilitation in a number of aspects. First, the monthly telephone monitoring, which, rather than detecting psychological problems, may have actually provoked distress by constantly reminding patients of their MI status. It may also have inadvertently led particular patients to believe they had a poor prognosis. For patients living alone, telephone reminders may have been especially difficult to deal with, given the absence of mitigating social support. In this context, it is noteworthy that in the M-HART programme there was greater mortality among patients living alone.\textsuperscript{71} Second, in contrast to most cardiac rehabilitation provision, delivered in a group setting, the absence of potentially supportive groups in the M-HART and Taylor et al. programmes may have mitigated against positive effects. Third, the absence of exercise rehabilitation may have been critical, as exercise has been shown to have antidepressive and anxiolytic effects. Finally, the nurses in both studies were not given any special training in psychiatric disorder screening or psychotherapeutic techniques. The Jones and West study,\textsuperscript{68} while generally well conceived, with clinical psychologists involved in the design and implementation of the intervention, had a number of shortcomings. First, their programme was brief, lasting only 7 weeks. Second, it was probably irrelevant to many patients, who showed neither high levels of depression nor anxiety. Third, there were no exercise or lifestyle management components in the programme. Finally, depression was measured using an unconventional instrument.

**Psychology in coronary care**

After-care for CHD patients is becoming increasingly multidisciplinary. There are at least two compelling reasons for the inclusion of psychological skills within cardiac rehabilitation. First, psychological factors are implicated in the prognosis of cardiac patients. Not only has psychological distress following MI been associated with mortality,\textsuperscript{27–29} it is also related to quality of life among survivors,\textsuperscript{53,54,72} and to patients’ capacity to adhere to medication and lifestyle modification.\textsuperscript{7} Second, although there are some null results, the bulk of the evidence indicates that psychological interventions, in combination with exercise and education to alter unhealthy behaviours, benefit patients relative to routine care, and that psychological interventions offer added value to standard exercise-based rehabilitation.\textsuperscript{50,51}

If participation in cardiac rehabilitation programmes reduces mortality and quality of life, then it is important that all cardiac patients are given the opportunity to attend. However, only 15% of eligible patients attend rehabilitation,\textsuperscript{8} and participants are generally those who already have a good prognosis, such as uncomplicated MI and CABG. In contrast, women, ethnic minorities, the elderly, angina sufferers, and those with more serious cardiac disease who could potentially benefit the most tend not to participate. Ades et al.\textsuperscript{73} found that women, particularly elderly women, are often not referred or encouraged to attend cardiac rehabilitation programmes, as a result of other health problems. However, evidence indicates that elderly patients who are depressed following MI, angioplasty, or CABG benefit greatly from cardiac rehabilitation in terms of improvements in depression, anxiety, and quality of life.\textsuperscript{33,34,74} Patients with more serious cardiac disease and those with disabilities or comorbid illnesses, could also benefit greatly from the health education components and stress management and relaxation techniques.\textsuperscript{75} Cardiac rehabilitation for angina would seem to be particularly important given its increased prevalence.\textsuperscript{2} Although there is less research on angina patients, early indications are that psychological...
treatments in combination with exercise can produce improvements in symptoms, reliance on medication, and exercise tolerance, and may even reverse atherosclerotic deterioration of the coronary arteries. While all patients should have access to rehabilitation, the precise provision should be tailored to individual needs. This is especially the case in potentially costly interventions aimed at ameliorating psychological distress, i.e. intensive cognitive-behavioural therapies targeted at depression, anxiety, and hostility should be reserved for those who exhibit high levels of these characteristics.

In general terms, psychologists should be part of the multidisciplinary team, working in conjunction with physicians, nurses, dietitians, and other medical personnel in the planning of aftercare, rehabilitation, and in the long-term process of re-adaptation and re-education. As part of this strategic role, psychologists would be concerned with determining patients’ psychological needs, implementing generic stress management and relaxation techniques, introducing specific cognitive-behavioural therapies for those exhibiting severe emotional distress, and training staff in psychological needs assessment and in the application, where appropriate, of psychological techniques and therapies.

Rehabilitation should begin as soon as the patients’ condition is stable, as determined by a physician. Coronary care nurses and other paramedical staff should be trained by psychologists to recognise severe psychological distress. The HAD Scale, a simple, user-friendly questionnaire, with two sub-scales to identify anxiety and depression, could be completed by patients before discharge from hospital. Many patients exhibit symptoms of psychological distress immediately after a coronary event, and this should be viewed as a normal reaction to such a life-threatening event. However, by the time patients are discharged from hospital, symptoms of anxiety and depression should have returned to pre-morbid levels. Those patients identified as being anxious and/or depressed at discharge, and those with a history of depression should receive specialized cognitive-behavioural intervention. It is extremely important to identify those patients who are psychologically predisposed to poor adaptation after a coronary event, and also to offer appropriate psychological intervention for those patients judged to require individual intensive counselling.

Before discharge, it may be difficult to predict accurately which patients will fail to adjust over the following months. Some patients may not exhibit symptoms of anxiety and depression until several weeks after discharge, when the full impact of their heart disease is realized. As rehabilitation programmes usually begin at this time, it is an ideal opportunity to re-assess all patients using the HAD scale. Any further emotionally distressed patients identified at this stage can be referred to specialized psychological treatment, in addition to generic cardiac rehabilitation.

Conclusions
The first step in managing cardiac patients should be routine screening to identify those who are severely distressed. All patients should be offered generic stress management and relaxation, in addition to health education and exercise rehabilitation. More emphasis should be given to tailoring cardiac rehabilitation to meet individual patients’ needs, both within the generic programme and by the provision of additional help for those with particular needs. The available evidence suggests that this is the optimal approach. The psychologist should be a key player in both patient assessment and treatment. However, we envisage the psychologists’ role as primarily strategic, advising on procedures and training those staff, in day-to-day contact with patients, in psychological assessment and treatment, with the availability of a psychological referral service for those patients judged to require individual intensive counselling.

Table 1 Important aspects of psychological support likely to benefit cardiac patients (adapted from reference 77)

| Intervention should begin as soon after the coronary event as possible |
| The intervention should be precise, organized and educational |
| Clinical levels of depression should be given special attention |
| The patient’s spouse or another close relative or friend should be encouraged to participate in the intervention |
| Interventions should be continuous from the CCU to an out-patient rehabilitation programme, and follow-up is essential |

References


