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"Prehabilitation" prior to CABG surgery improves physical functioning and depression ☆

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Abstract

Background: Many patients demonstrate psychological distress and reduced physical activity before coronary artery bypass graft surgery (CABG). Here we evaluated the addition of a brief, cognitive-behavioural intervention (the HeartOp Programme) to routine nurse counselling for people waiting for CABG surgery.
Methods: Randomised controlled trial comparing nurse counselling with the HeartOp programme to routine nurse counselling in 204 patients awaiting first time elective CABG. Primary outcome measures were: anxiety and length of hospital stay; secondary outcome measures were: depression, physical functioning, cardiac misconceptions and cost utility. Measures were collected prior to randomisation and after 8 weeks of their intervention prior to surgery, excepting length of hospital stay which was collected after discharge following surgery.
Results: 100 patients were randomised to intervention, 104 to control. At follow-up there were no differences in anxiety or length of hospital stay. There were significant differences in depression (difference=7.79, $p=0.008$, 95% CI=2.04–13.54), physical functioning (difference=0.82, $p=0.001$, 95%CI=0.34–1.3) and cardiac misconceptions (difference=2.56, $p<0.001$, 95%CI=1.64–3.48) in favour of the HeartOp Programme. The only difference to be maintained following surgery was in cardiac misconceptions. The HeartOp Programme was found to have an Incremental Cost Effectiveness Ratio (ICER) of £288.83 per Quality-Adjusted Life Year.
Conclusions: Nurse counselling with the HeartOp Programme reduces depression and cardiac misconceptions and improves physical functioning before bypass surgery significantly more than nurse counselling alone and meets the accepted criteria for cost efficacy.

Keywords: Pre-operative care; Coronary artery bypass; Self-care; Cognitive-behavioural treatment

1. Introduction

Many patients find the uncertainty and fear of waiting for coronary artery bypass (CABG) surgery to be more disturbing than their chest pain [1,2]. This may have long term disabling consequences, as patients adopt a sedentary lifestyle so that the normal routines of work and active hobbies are lost, sometimes forever [3]. As a result quality of life and physical and mental health may decline [4].

Cognitive-behavioural chronic disease management programmes have been shown to reduce anxiety and

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depression and readmissions after MI [5]. A brief cognitive-behavioural programme for patients with angina has been found to reduce psychological distress and self-reported episodes of angina as well as improving physical functioning [6].

Nurse-led educational programmes also reduce anxiety and depression and improve health behaviours in patients awaiting CABG. For example, an intervention based on motivational interviewing was found to reduce risk factors and improve physical and psychological functioning [7]. A preoperative, hospital based exercise programme reduced post-operative hospital stay and improved quality of life [8].

One of the problems of delivering pre-surgical interventions for these patients is that many live at a distance from the hospital where the surgery is to be conducted. A recent review of uptake of rehabilitation showed distance from the programme and transportation problems to be major barriers to attending hospital based rehabilitation programmes [9]. One solution is to deliver the intervention in the patients' home. A recent systematic review and meta-analysis of home-based rehabilitation showed it to be as effective as hospital based programmes [10].

The aim of the study reported here was to evaluate a brief, home-based cognitive-behavioural, phone facilitated programme (the HeartOp Programme) for patients awaiting elective CABG. Pre-operative nurse counselling for behaviour change is routine care in some centres within the UK. For that reason, we chose to compare the HeartOp Programme to routine preoperative nurse counselling, rather than compare it to "no intervention", and give both interventions a similar amount of patient contact time. It was accepted that there may be some overlap in the interventions, and so any effects of the HeartOp Programme would be weakened, but we believed that it was important to test the programme against the current version of optimal care.

1.1. Objectives

To test the HeartOp Programme in a randomised controlled trial compared to preoperative nurse counselling.

1.1.1. Hypothesis

Patients taking part in the HeartOp Programme would be less anxious preoperatively and have a shorter length of stay following surgery compared to patients receiving a similar amount of time and attention from a specialist nurse.

2. Materials and methods

2.1. Patients and settings

Hull and East Riding local Research Ethics Committee approved the study, and all participants gave informed consent.

Patients who were placed on the elective waiting list for first time CABG in a tertiary centre in northern England were screened for eligibility using the following criteria:

Inclusion criteria: All patients admitted to the routine (non-urgent) waiting list for CABG at a cardiothoracic centre, ability to give informed consent.
Exclusion criteria: Exercise induced arrhythmias, loss of systolic BP greater than 20 mm Hg during exercise stress testing, unstable angina, a score of 4 on the Canadian Cardiovascular Society classification for angina or the New York Heart Association classification of heart failure, current psychiatric problems, dementia, self report of periods of dizziness or confusion, life threatening co-morbidities, concurrent participation in other research.

Patients meeting the criteria were invited into the study by a letter from their cardiac surgeon. Those wishing to participate attended an outpatient clinic where informed consent and baseline investigations were undertaken which included: New York Heart Association (NYHA) classification of breathlessness [11], Canadian Cardiovascular Society Angina Class (CCSAC) [12], systolic blood pressure (SBP), body mass index (BMI), smoking status (verified by expired carbon monoxide level), Step Test — a validated, safe and simple clinical instrument that strongly and reliably predicts VO_2 max and is sensitive to change [13].

2.2. Interventions

Both interventions consisted of a 45–60 minute first interview conducted in the outpatients clinic by the nurse facilitator, followed by 10–15 minute phone calls to their home at weeks 1, 3 and 6 (+/−1 week) and then monthly until they were admitted for their operation. As previously stated, it was accepted that there was a possibility of some contamination in the delivery of the interventions. For example, smokers in both arms of the study were advised to attend NHS smoking cessation groups as this is considered the best practice. In order to keep contamination between the interventions to a minimum, a prompt sheet was used to structure the interviews and a checklist of questions for the telephone follow-up was used for each intervention. The written materials were different for each intervention.

2.2.1. The HeartOp Programme (experimental) intervention

The HeartOp Programme comprises of a two-part patient-held booklet (the HeartOp Plan) which covers: cardiac myths and misconceptions, reducing risk factors for secondary prevention, and what to expect during the hospital stay and subsequent recovery period. The programme also includes a relaxation programme on audiotape or CD and a diary for recording activity and risk factor reduction goals. The 'facilitator' initially aims to dispel specific cardiac misconceptions (which have been shown to be predictive of psychological distress and poor coping [14,15]), and to then