Can Cognitive Behavioral Therapy Prevent Recurrent Cardiovascular Events?

Gulliksson M, Burell G, Vessby B, et al. Randomized controlled trial of cognitive behavioral therapy vs standard treatment to prevent recurrent cardiovascular events in patients with coronary heart disease. Arch Intern Med 2011;171:134–40.

Study Overview

Objective. To measure the effects of group-based cognitive behavioral therapy (CBT) versus usual care on cardiovascular disease (CVD) events in patients with coronary heart disease (CHD).

Design. Randomized controlled trial (The Secondary Prevention in Uppsala Primary Health Care Project [SUPRIM]).

Setting and participants. This study was conducted at Uppsala University Hospital in Sweden from 1 May 1996 until 31 Aug 2002 and included men and women discharged after a CVD event within the past 12 months. Other inclusion criteria were age ≤ 75 years, having been discharged from the hospital after an acute myocardial infarction (AMI), percutaneous coronary intervention, or coronary artery bypass grafting. Patients also had to speak Swedish, live in the hospital catchment area, be healthy enough to be referred back to a primary care provider, and be willing to participate and accept random allocation. Patients were excluded if they had participated in a similar program. At 3 to 12 months' postdischarge, patients were randomized to either traditional care (risk factor optimization) or traditional care plus 20 two-hour sessions of group-based CBT focused on stress management. The groups consisted of 5 to 9 same-sex participants, and the program was structured and standardized and delivered by a team of clinical psychologists, nurses, and experts in working with patients with CHD. The program had 5 key elements (education, self-monitoring, skills training, cognitive restructuring, and spiritual development) and was focused on stress reduction and management.

Main outcome measures. The main outcome measures were the first recurrent CVD event (fatal and nonfatal), the first AMI (fatal and nonfatal), and all deaths after enrollment into the study. This data was obtained by linking hospital records to national registries (the National Hospital Discharge Registry and the National Cause of Death Registry). Hospital discharge diagnoses and causes of death were coded according to the International Classification of Diseases (ICD), versions 8–10. Secondary outcomes were psychosocial variables (vital exhaustion, coping, and credence in the future) [1].

Main results. 362 subjects were randomized to the intervention group (n = 192) or traditional care (n = 170). The average age of the subjects was 62 years, and approximately 23% were female. Seventy-eight percent were married. There were no differences between the 2 groups at baseline with regard to demographics, medical variables (ie, previous history of MI, diabetes, or stroke, systolic and diastolic blood pressure, low-density lipoprotein), or psychosocial variables.

Mean follow-up time in the intervention group was 96 months (median, 95 months; range, 14–128) and 91 months in the reference group (median, 94 months; range, 15–127). In the intervention group, median attendance was 85% per session; only 4.2% of subjects attended less than 50% of sessions. During the first 24 months of follow-up, there were no significant differences in use of medications, in-

cluding diuretics, beta blockers, calcium channel blockers, angiotensin-converting enzyme inhibitors, lipid-lowering drugs, antidepressants, or other medications.

On multivariate Cox proportional hazard regression, there was a nonsignificant 28% reduction in all-cause mortality in the intervention group (adjusted hazard ratio [HR], 0.72 [95% confidence interval {CI}, 0.40–1.30]; $P = 0.28$). For CVD outcomes in the intervention group, 69 participants (35.9%) had a nonfatal CVD event and 1 (0.5%) had a fatal CVD event. In the reference group, 77 (45.3%) had a nonfatal CVD event and 3 (1.8%) had a fatal CVD event. After adjusting for the effects of outcome-affecting variables using multivariate Cox regression, the intervention group had 41% fewer fatal or nonfatal CVD events (HR, 0.59 [95% CI, 0.42–0.83]; $P = 0.002$). There were 41 (21.4%) nonfatal AMIs in the intervention group versus 51 (30.0%) in the reference group. Two participants in the reference group and none in the intervention group had a fatal AMI. In multivariate Cox analysis, the intervention group had 45% fewer fatal and nonfatal AMIs than the reference group (HR, 0.55 [95% CI, 0.36–0.85]; $P = 0.007$).

A dose-response relationship between attendance rate in the group sessions and outcome rate was found. Fifty-three percent of those attending fully vs. 73% of those attending marginally in the intervention group had a first recurrent CVD. The authors estimated that to prevent 1 CVD recurrent event, 9 participants needed to "pass" the program, although they did not specify what it meant to pass.

Conclusion. In patients with CVD an intensive 40-hour group-based CBT program decreased the risk of recurrent CVD and AMI.

Commentary

The risk of death after a CVD event is high, with 1-year mortality rates of 6.5%, 10%, and 5.4% for Q-wave myocardial infarction, non-Q-wave myocardial infarction, and unstable angina, respectively [2]. Investigators have consistently found that the prevalence of stress, depression, poor perceived social support, and other psychosocial variables are high in patients with CVD, and these variables increase the risk of recurrent CVD and MI [3–6]. The SUPRIM study found that an intensive, group-based CBT program reduced the risk of recurrent CVD and AMI.

This study was a well-designed randomized controlled trial: data analysis was done using intention to treat, and there was a relatively long duration of follow-up, with high participation and retention rates. Weaknesses included that it was a single-center trial and that the Swedish subjects were ethnically and racially homogenous (90% Swedish born, 95% Caucasian) [1], limiting the external validity of the findings. Further, the subjects could not be blinded to the intervention, and the authors did not report prevalence of depression or low perceived social support, 2 variables known to predict poorer outcomes post MI [3,4]. Finally, no information was presented about the costs of the intervention.

A handful of studies have tried various educational, behavioral, and counseling strategies to reduce CVD recurrence. A meta-analysis of 23 randomized controlled trials of various psychosocial interventions showed an increased morbidity and mortality in the control groups during the first 2 years (odds ratio [OR], 1.7 [95% CI, 1.09–2.64])[7]. A Cochrane review of studies concluded that while various psychosocial interventions reduced nonfatal reinfarctions (OR, 0.78 [95% CI, 0.67–0.90]), the 2 largest studies were null for this outcome and there was evidence of publication bias [8]. In the ENRICHD study (Effects of Treating Depression and Low Perceived Social Support on Clinical Events After Myocardial Infarction) [9], 2481 post-MI patients with depression and/or low perceived social support (LPSS) were randomized to either a CBT-based intervention, with mostly individual and some group sessions, or usual care. Unlike the SUPRIM intervention, the ENRICHD intervention did not improve event-free survival (average follow-up time was 29 months).

It is unclear why the SUPRIM intervention reduced cardiovascular morbidity while the ENRICHD study did not. The patient populations in each study were different. Unlike the SUPRIM study, the ENRICHD study included only those with depression and/or LPSS, who presumably are at higher risk for recurrent CVD. Further, the ENRICHD study was a multicenter study that enrolled a much larger sample of nonwhite patients (34%) [9]. Alternatively, intervention differences may account for the disparate outcomes. The SUPRIM study used only group therapy while the ENRICHD study used mainly individual sessions, with group therapy available to some of the patients. Since the SUPRIM study did not have a control group that received group therapy in the absence of CBT, it is unclear whether group-based social support alone could have achieved the same results or if the structured CBT is a necessary component of the intervention. However, in a study of 2328 post-MI subjects, participants in non-CBT group counseling showed no improvement in psychosocial or medical outcomes when compared with standard care [10]. Finally, the longer duration of therapy and follow-up in the SUPRIM study could also account for differences in outcome. Regardless, the SUPRIM study adds to evidence in favor of using psychosocial interventions for secondary prevention of CVD events in patients with CHD.

Applications for Clinical Practice

Group-based CBT is efficacious for secondary prevention of cardiovascular disease events in a homogenous population with a high rate of adherence and participation. Future

studies need to determine if these results can be replicated in diverse populations. In addition, future studies should test whether group-based social support and CBT are both necessary components of the intervention.

—Review by Melanie Jay, MD, MS

References

1. Gulliksson M, Burell G, Lundin L, et al. Psychosocial factors during the first year after a coronary heart disease event in cases and referents. Secondary Prevention in Uppsala Primary Health Care Project (SUPRIM). BMC Cardiovasc Disord 2007;7:36.
2. Yan AT, Tan M, Fitchett D, et al; Canadian Acute Coronary Syndromes Registry Investigators. One-year outcome of patients after acute coronary syndromes (from the Canadian Acute Coronary Syndromes Registry). Am J Cardiol 2004;94:25–9.
3. Berkman LF, Leo-Summers L, Horwitz RI. Emotional support and survival after myocardial infarction. A prospective, population-based study of the elderly. Ann Intern Med 1992;117:1003–9.
4. Bush DE, Ziegelstein RC, Tayback M, et al. Even minimal symptoms of depression increase mortality risk after acute myocardial infarction. Am J Cardiol 2001;88:337–41.
5. Jaffe AS, Krumholz HM, Catellier DJ, et al; Enhancing Recovery in Coronary Heart Disease Patients (ENRICHD) Trial Investigators. Prediction of medical morbidity and mortality after acute myocardial infarction in patients at increased psychosocial risk in the Enhancing Recovery in Coronary Heart Disease Patients (ENRICHD) study. Am Heart J 2006;152:126–35.
6. Burg MM, Barefoot J, Berkman L, et al; ENRICHD Investigators. Low perceived social support and post-myocardial infarction prognosis in the enhancing recovery in coronary heart disease clinical trial: the effects of treatment. Psychosom Med 2005 67:879–88.
7. Linden W, Stossel C, Maurice J. Psychosocial interventions for patients with coronary artery disease: a meta-analysis. Arch Intern Med. 1996;156:745–52.
8. Rees K, Bennett P, West R, et al. Psychological interventions for coronary heart disease. Cochrane Database Syst Rev 2004;(2): CD002902.
9. Berkman LF, Blumenthal J, Burg M, et al. Effects of treating depression and low perceived social support on clinical events after myocardial infarction: the Enhancing Recovery in Coronary Heart Disease Patients (ENRICHD) randomized trial. JAMA 2003;289:3106–16.
10. Jones DA, West R. Psychological rehabilitation after myocardial infarction: multicentre randomised controlled trial. BMJ 1996;313:1517–21.