The Effectiveness of Cardiac Rehabilitation Programs with and without Exercise Components

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The full report is titled "Meta-Analysis: Secondary Prevention Programs for Patients with Coronary Artery Disease." It is in the 1 November 2005 issue of *Annals of Internal Medicine* (volume 143, pages 659-672). The authors are A.M. Clark, L. Hartling, B. Vandermeer, and F.A. McAlister.

What is the problem and what is known about it so far?

Coronary artery disease (CAD) is the result of blockages in the heart's blood vessels. Low blood flow to the heart due to blocked vessels causes chest pain or "angina." If angina lasts long enough, a section of heart muscle dies, a condition called myocardial infarction (or "heart attack"). Risk factors for CAD include older age, male sex, high blood pressure, diabetes, smoking, high levels of total or low-density lipoprotein ("bad") cholesterol and low levels of high-density lipoprotein ("good") cholesterol, and family history of CAD. Modifying these risk factors after a heart attack can reduce a person's chance of having another heart attack. Doctors advise patients who have had a heart attack to participate in organized programs, called cardiac rehabilitation programs or secondary cardiac prevention programs, to reduce cardiac risk. The programs provide education and counseling to help patients improve or eliminate factors that are associated with CAD (unfavorable cholesterol levels, high blood pressure, smoking, and physical inactivity). They also often, but not always, include supervised exercise. Previous studies have established that cardiac rehabilitation programs that include supervised exercise improve survival after heart attack. However, the effectiveness of cardiac rehabilitation programs that do not include supervised exercise is less clear.

Why did the researchers do this particular study?

To see whether cardiac rehabilitation programs improve outcomes for people after heart attack regardless of whether they include supervised exercise.

Who was studied?

21,295 patients with CAD who were included in 63 randomized trials.

How was the study done?

The researchers searched computer databases of published studies from 1966 to 2004 to identify studies that randomly assigned patients to different types of cardiac rehabilitation programs to study whether the patients who participated in the programs had better survival, quality of life, and ability to carry out daily activities than patients who did not participate in the programs. They used a statistical technique called meta-analysis to combine the results of the various studies.

What did the researchers find?

Sixty-three studies of cardiac rehabilitation programs met their criteria. Overall, patients who participated in cardiac rehabilitation programs had better survival after heart attack than patients who did not participate in a program. Improvements in quality of life and ability to carry out daily activities were also better in patients who participated in cardiac rehabilitation programs. The programs seemed to be beneficial regardless of whether they included supervised exercise. However, the results suggest that the programs with supervised exercise might have a larger benefit than those that did not include exercise.

What were the limitations of the study?

Many included studies were of poor quality. No large, high-quality studies directly compared programs with exercise and those without exercise.

What are the implications of the study?

Cardiac rehabilitation programs seem to improve outcomes for patients after heart attack regardless of whether the programs include supervised exercise.