

Current Status of Secondary Prevention and Cardiac Rehabilitation Programs in Spain

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Secondary prevention and cardiac rehabilitation programs include all the measures available for decreasing mortality and the risk of experiencing new episodes in patients with chronic heart disease, improving the patient's functional capacity, and promoting the self confidence required to resume family relations and social and employment activity. These programs also include the study of close relatives of high-risk patients to prevent the development of the disease in family members.

The main activities of current programs include: *a)* clinical control of risk factors; *b)* programmed physical training; *c)* psychological therapy, and *d)* study of first-degree relatives of patients at high risk for ischemic heart disease.

Cardiac rehabilitation was first undertaken decades ago with prescriptions for physical exercise and psychological support. In the 1990s numerous clinical trials reported positive results associated with interventions for cardiac risk factors and the use of cardioprotective drugs. Since that time these components have been incorporated into cardiac rehabilitation activity and the result is the present-day secondary prevention and rehabilitation programs.^{1,2}

Over the years, the usefulness of these programs has been fully demonstrated in numerous studies involving patients with ischemic heart disease and more recently in chronic heart failure and heart transplantation patients. Patients with operated and unoperated valvulopathy, cardiomyopathy, arrhythmia (particularly arrhythmia due to autonomic dysfunction), severe coronary risk factors, or circulatory asthenia have also experienced improvements. In contrast to what was formerly believed, we now know that all cardiac patients benefit from these programs, especially older patients

and those with severe disease.^{3,4}

The two- to three-month period when the patient comes to the hospital to participate in the program provides a singular opportunity for clinical follow-up of the disease and adjustment of the medication. Cardioprotective drugs associated with large reductions in morbidity and mortality, such as angiotensin-converting enzyme (ACE) inhibitors, antiplatelet agents, beta-blockers and lipid-lowering drugs, should be prescribed and their dose adjusted as part of such programs. In our opinion, this is the cardiologist's most important activity—one that provides the greatest intermediate- and long-term benefits for the patient.

Risk-factor control, within the demanding objectives of secondary prevention, requires pharmacological treatment in the majority of cases and sometimes the use of drug combinations, a factor that can potentially lead to increased complications. Frequent monitoring by expert professionals is required to prevent complications, and the cardiac rehabilitation program provides an excellent framework to carry this out.

Several Spanish and European studies have reported an elevated prevalence of hypercholesterolemia and other risk factors in post-infarction patients. This is a sign that secondary prevention programs have failed or are nonexistent, as is the case in Spain. The Prevese II⁵ study estimated the following prevalence of risk factors in more than 2000 patients with ischemic heart disease discharged from Spanish hospitals: hypertension in 47.5%, smoking in 35.4%, dyslipidemia in 34%, obesity in 31% and type 2 diabetes mellitus in 22.6%. In comparison, patients discharged from the secondary prevention and cardiac rehabilitation program of Hospital La Paz in Madrid presented the following prevalence of risk factors: hypertension in 7%, smoking in 0%, dyslipidemia (cholesterol bound to low-density lipoproteins [LDL-C] >100 mg/dL) in 15%, and obesity in 18%. After participating in the program, the patients had a 20% reduction in total cholesterol to a final mean value of 176 mg/dL; a 30% reduction in triglycerides to a final mean value of 107 mg/dL; a 13% increase in

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cholesterol bound to high-density lipoproteins (HDL-C) to 45 mg/dL; a 29% reduction in LDL-C to 88 mg/dL and a 15% reduction in blood pressure to 110/70 mm Hg.

These results contrast with those of the Prevese II study and are a clear indication of the approach that should be taken to improve the prognosis of cardiology patients in Spain. The creation of cardiac rehabilitation programs in centralized hospital units and the extension of these programs into the healthcare areas by cooperative efforts with primary care centers based on joint protocols could be a suitable way to organize secondary prevention in cardiology services.

Physical training, individualized for each patient according to the results of ergometric testing, leads to a considerable increase in functional capacity and a reduction in mortality. Exercise provides numerous benefits: favorable effects on lipids and other risk factors, increased heart rate variability and autonomic tone, improved endothelial dysfunction, increased fibrinolysis and, above all, improved oxygen metabolism in skeletal muscle and myocardium. In many patients, functional capacity improves without substantial changes in ventricular function. Increased functional capacity is a potent long-term negative predictor for overall and cardiovascular mortality, as has been demonstrated in studies with nearly 20 years of follow up. In our group at Hospital La Paz, mean functional improvement is 30%-50%, a rate that is usually sufficient for patients to lead a normal life. Supervised exercise is a good test for confirming the efficacy of the procedures carried out and for adjusting the patient's medication.

Psychological treatment in patients who require it and training in relaxation techniques are classic elements of rehabilitation programs that boost confidence and self-esteem. Many of these patients have type A personalities and must learn to cope with life's ordinary problems in a new way. These programs offer a unique opportunity to achieve this.

The study of first-degree relatives of patients with early ischemic heart disease is based on familial aggregation of the disease and of risk factors, whether of genetic or environmental origin, and is essential to prevent the appearance of additional cases of disease. The objective of this aspect of the program is not to actually study the family members, but instead to refer them appropriately for monitoring by their physicians. This preventive strategy is highly cost-effective.

The specific characteristics and problems of each patient will determine the content and duration of the program, which should be adapted to the individual. All the programs have the common objective of reducing the progression of the disease and the development of complications. The way to accomplish this depends on the patient's circumstances.

The classic candidates for these programs are patients who have had a myocardial infarction or revascularization procedure. If possible, the program should be initiated even before surgery or coronary angioplasty. Patients who stop smoking, lose weight, achieve a satisfactory level of physical fitness, and control their hypertension and lipid levels are less likely to experience complications after cardiac surgery and more likely to survive if they occur. After surgery and angioplasty, the program should pay utmost attention to recovery of functional capacity so that the patient can resume social activities and return to work as early as possible.

The contraindications for physical training (but not to other sections of the secondary prevention program) have decreased over time. The absolute contraindications mainly include dissecting aortic aneurysms and severe left ventricular outflow tract obstructions, which must be resolved before initiating physical exercise. Other pathologies, such as acute coronary syndrome, severe arrhythmia, concomitant pulmonary disease, etc., are considered temporary contraindications in the majority of cases.

Clinical studies have demonstrated that morbidity and mortality decrease significantly and the number of individuals returning to work increases up to three-fold in patients following these programs in comparison to those that do not.¹ Meta-analyses of 21 randomized and controlled studies carried out in the 1970s and 1980s, involving more than 4000 patients, demonstrated a 25% reduction in overall mortality and cardiovascular mortality at three years. These programs ran, it should be noted, before the era of ACE inhibitors and hypolipidemic drugs.

Clinical trials conducted with hypolipidemic drugs in patients with ischemic heart disease have demonstrated reductions in coronary mortality and overall mortality of 40% and 30%, respectively. Control of other risk factors, such as smoking and blood pressure, also reduces cardiovascular and overall mortality. The beneficial effects of cardioprotective drugs such as beta-blockers, ACE inhibitors, and antiplatelet agents in patients with ischemic heart disease are well recognized in current clinical practice.^{2,6}

Although difficult to assess, the improvement in quality of life is notable in the majority of patients who take part in these programs. This is achieved through better clinical control, improved functional capacity, enhanced self-confidence, metabolic improvement, etc. Sometimes patients gain in quality of life without having shown any improvement in final results of ergometric testing in comparison to initial values.

Benardinelli et al³ demonstrated sustained improvement in functional capacity and quality of life, and trends toward reductions in mortality and hospital

readmissions in a group of patients with ventricular dysfunction and heart failure following a physical exercise program. Until a few years ago exercise was contraindicated in these patients.

In a study of 68 patients on the waiting list for a heart transplant, functional capacity improved so much after cardiac rehabilitation that 31 could be taken off the list. After transplantation the denervated heart responds abnormally to exercise, showing reduced tolerance. Nevertheless, a substantial improvement in oxygen consumption and functional capacity has been found in these patients.⁴

Cost studies in the United States and in Scandinavian countries have demonstrated that these programs are highly cost-effective. At the Ramón y Cajal Hospital in Madrid, Maroto et al showed cost savings of more than 1600 euros per patient during the first year and 14 500 euros per patient during the six years of follow-up.⁷ The cost-effectiveness and cost-benefit ratios of these programs are now considered the most favorable of all the treatments and interventional measures used in cardiac patients. To maximize cost benefits, the patients included in hospital exercise programs should present moderate to high risk. Low-risk patients can perform the exercise programs at home or in other area centers, with periodic check-ups in the unit to assess the risk factors.

In the series reported by Maroto et al, almost twice as many patients in rehabilitation programs were able to resume employment, both in the first year and in the sixth, as compared to those outside of these programs. Other studies have shown that 85% of patients on rehabilitation were able to return to work as compared to 30% of those who followed the usual measures.

Nonetheless, some factors should be considered with regard to the benefits of these programs. First, the results of clinical trials cannot be extrapolated to daily clinical practice, unless similar levels of control are applied. Patients included in our program receive a mean of 6 or 7 different drugs. Sometimes they need high doses of medication and combination drug therapy. Many errors occur when taking medication because of factors inherent to the patient and because of coordination problems among the doctors assisting the patient. We recently observed an increase in the risk of death when cerivastatin was given in association with gemfibrozil. In our opinion, patients at a high risk of complications such as these should be under more rigorous management than is currently applied and should have the possibility of referral to hospital units. Second, the benefits of these programs diminish over the years; thus, an organizational structure that joins the hospital unit with other centers in the health care area should be created to enable permanent follow up and monitoring of patients who require it.

In summary, secondary prevention and cardiac rehabilitation programs achieve a reduction in overall mortality, a significant decrease in coronary and cardiovascular morbidity and mortality, improved quality of life, and resumption of social and occupational activities in the majority of patients. Related cost analyses are very favorable. These programs are recommended by numerous official organizations such as the WHO,¹ and by clinical guidelines from major medical organizations and societies.^{2,6} In addition, they are being offered to a significant percentage of patients in the most developed countries in the western world.

In the present issue of *REVISTA ESPAÑOLA DE CARDIOLOGÍA* there is an article by Márquez Calderón et al titled «Incorporation of Cardiac Rehabilitation Programs and their Characteristics in the Spanish National Health Service».⁸ The study discloses that cardiac rehabilitation programs in Spain are limited to a small number of hospitals and are available to very few patients. Only around 2% patients with myocardial infarction benefit from these programs, whereas the percentage is higher than 50% in some other developed countries of the West. This situation draws one's attention precisely because the Spanish health care model has public financing and should be accessible to everyone in the public health care system, whatever their economic level. Nevertheless, both in Spain and in other developed countries, regardless of the health care model, these programs are localized mainly in the most advanced hospitals in the wealthiest cities and regions.

From the cardiologists' viewpoint, the study lacks relevant data on risk factor control and the application of high risk strategies in the study of family members with early ischemic heart disease, basic components that are recommended in the clinical guidelines of the Sociedad Española de Cardiología (Spanish Society of Cardiology).^{9,10} The impression that little attention is paid to cardiac risk factor control in current programs may have arisen because of a defect in the design of the survey, and this would constitute an important limitation of the study. Additionally, the programs referred to in the article are in public health care hospitals, implying a selection of moderate-to-high risk patients. Thus, more information should have been compiled on the material and human resources available in each unit for monitoring and treating cardiac complications (telemetry, defibrillators, presence of cardiologists and other staff members trained in cardiopulmonary resuscitation). However, information on risk factor control and rehabilitation unit resources may be absent simply because these features are not present in the public hospitals, a fact that would further aggravate the situation described.

The main contribution of the study is the dismal portrait of secondary prevention in Spain and the

urgent need for improvement. It is difficult to explain why the organizational model used in hospital cardiology services still focuses on the treatment of acute crises in cardiac disease, when the vast majority are chronic diseases. It is also hard to understand why initiatives to provide patients with more complete attention to prevent recurrence have not been put into practice, particularly in the light of extensive evidence demonstrating reductions in mortality, morbidity and hospital readmissions with these programs. As the cultural and economic level of the Spanish population increases, people are asking for more services in the area of cardiovascular prevention.

In the year 2002, the European Union accepted the Action Plan proposed by the European Cardiology Society for the development of this specialty in the coming years.¹¹ The plan includes expert training and the enhancement of special areas, such as prevention. That same year in Spain, the Ministry of Health and the Spanish Society of Cardiology signed an agreement to advance comprehensive treatment of ischemic heart disease, which includes secondary prevention and rehabilitation among the highest-priority objectives.

The cardiology services of Spanish public hospitals should begin to make efforts to meet the aims set down in these documents, optimize expenditures and reassign material and human resources in their areas to provide every eligible patient with access to secondary prevention and rehabilitation programs, thereby affording equal opportunities to all patients with heart disease. Cardiology is facing the challenge of developing these preventive programs, which are now overshadowed by a fascination with high technology and interventional cardiology, measures that do not always provide the greatest overall benefits to the population.

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